products finishing

FEBRUARY
1961

Improve Your Phosphate Coatings

Do metallurgical conditions affect phosphatizing?

What causes "post rusting?"
How can I prevent it?

What should a finisher consider in specifying coating weights?

What increases sludge formation?

When should you dump a phosphatizing bath?

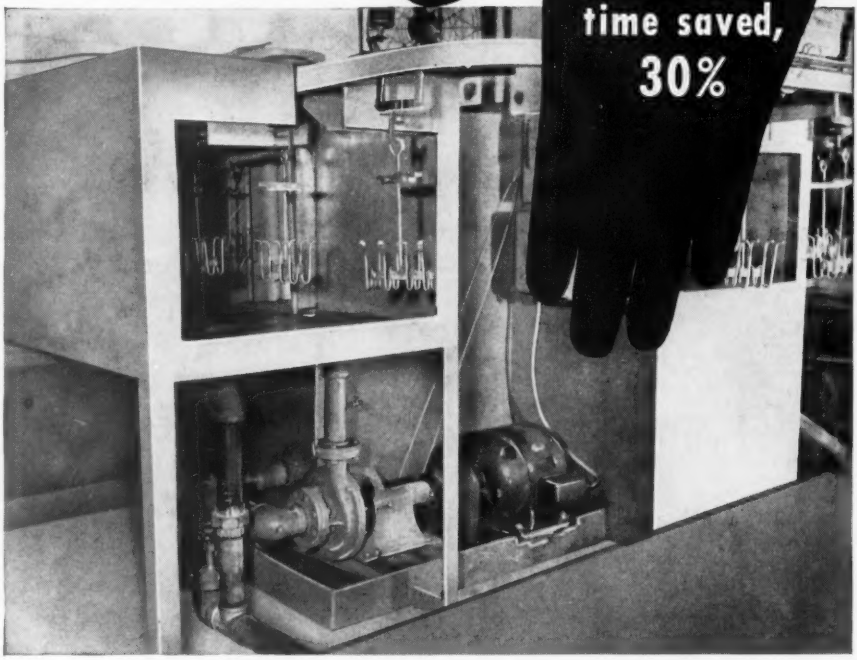
What causes chalking?

finishes on metal products

see page 78

Cincinnati Cleaning

eliminates messy hand operations... time saved, 30%



for A LARGE REFRIGERATOR MANUFACTURER

Even the smaller CINCINNATI Cleaning and Finishing Machines do a far better job . . . faster . . . and for far less in materials, labor and total costs. Here, for example, a monorail washer removes iron oxide from stainless steel parts at a 300 piece per hour rate. Over the former, messy hand operation, a 30% labor saving is achieved.

At your invitation, a CINCINNATI Engineer will explain *the practical way* to take the high-cost "sting" out of cleaning and finishing operations. No obligation, of course . . . write today!

Cincinnati

CLEANING AND FINISHING MACHINERY COMPANY, CINCINNATI, OHIO

INSTALLATIONS INCLUDE: A. C. SPARK PLUG • AMERICAN ELECTRIC FURNACE • CHRYSLER • CROSLEY • DANAHY PACKING • FORD INTERNATIONAL HARVESTER • STANDARD BRANDS *and many others.*

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Want to strip an "unstrippable" coating?

ask Oakite

OVER 50 YEARS CLEANING EXPERIENCE • OVER 250 SERVICE MEN • OVER 160 MATERIALS

Even tough EPOXY FINISHES peel off in Oakite STRIPPER S-A

Burn off an epoxy finish from a reject as a last resort? Not at all necessary. Oakite STRIPPER S-A strips metals clean. That's true for multiple coats as well as single coat epoxy finishes. Look at STRIPPER S-A's record:

- *A 3/16" thick coating built up from layers of epoxy coating and wrappings of fiber glass was stripped from gun barrels by overnight soak in Stripper S-A. Everything tried previously had failed.*
- *Brass plated steel parts were stripped of their epoxy finish in matter of minutes.*
- *Workholding spindles and racks laden with at least 10 coats were stripped to bare metal by a short soak. Paint hooks formerly burned clean are now soaked clean instead.*

This powerful stripper is safe for all metals except zinc and magnesium. And it's safe to the user, since it works cold . . . has no flash point . . . rinses with water.

STRIPPER S-A is but one of a long list of superior strippers by Oakite. Some are specially formulated for use on steel . . . aluminum . . . other metals. Some for removing lacquers . . . tough synthetic finishes. Still others are designed especially for removing paint from vertical surfaces. Whatever your paint-stripping problem—Oakite is bound to have the answer. Ask your local Oakite man or send for paint-stripping bulletin F-7893. Oakite Products, Inc., 20 Rector Street, New York 6, N. Y.

it PAYS to ask Oakite

OAKITE

OVER 50 *Est. 1909* SCIENCE *years' leadership in industrial cleaning*

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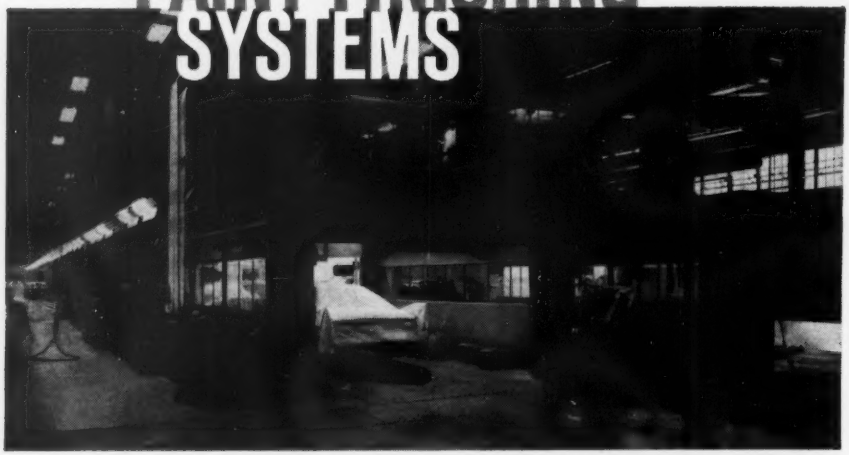
ROSS

COMPLETE PAINT FINISHING SYSTEMS



Everything from METAL CLEANING through DRY-OFF on to FLOW COATING into SOLVENT VAPOR ENCLOSURE to FLASH OFF into PRIME COAT BAKE OVEN on to FINISH COAT then to FINISH COAT BAKE OVEN into COOL on to INSPECTION

The whole system is an engineered combination of the most modern ROSS components including metal preparation units, spray booths, flow coat units, dry-off ovens, air make-up units, air heaters, conveyors and air conditioning units. Now, a single responsibility for the entire system—engineered, designed, constructed and erected by J. O. Ross Engineering. For more information send for Paint Finishing Bulletin No. PF 401.

J.O. ROSS ENGINEERING

A Division of Midland-Ross Corporation/730 Third Ave., New York 17, New York

ATLANTA • BOSTON • DETROIT • LOS ANGELES • SEATTLE • MT. PROSPECT, ILL. • MOBILE

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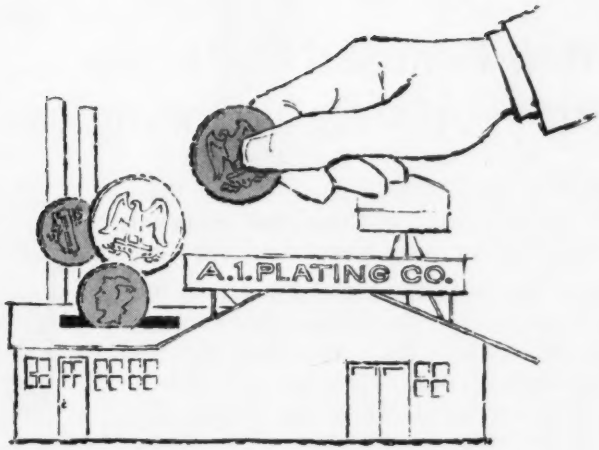

EXTRA PROFITS for your plant

Customers satisfied with a high quality utility zinc brightener that costs you less? Then, your profit-wise choice is:

ROHCO® ECONOBRITE ZINC BRIGHTENER

Exceptional life. For plated parts where bright dipping after plating may be planned. Cannot be equaled in economy—with quality.

For customers who require greatest brilliance, the brightener that tops them all is:

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The champagne of all brighteners. 3-D depth for mirror-like finish. Highest covering power — substantial thickness of deposit in recesses usually unplated.

Both brighteners furnished in liquid. A winning team that will gain and hold the approval of your customers.

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ROHCO

------Nationwide Stockpoints------

R. O. HULL & COMPANY INC.

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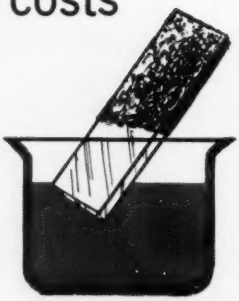
The RIGHT START . . . a BETTER FINISH

For more data circle 306 on Postpaid Card

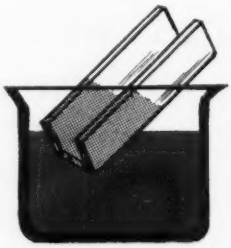
3 new Pennsalt materials to cut your metal finishing costs



Latest news from the Pennsalt Metal Preparation Service Plan is three new materials that can help cut your metal finishing costs.

Pennsalt Alkaline Deruster AD-40—100% active, non-electrolytic powder. Removes rust and oxidation, heat treating stains, zinc and iron phosphate coatings. Easy to handle. Contains no cyanides—no waste disposal problems.

Pennsalt Stripper X-28—liquid additive for use with caustic soda solutions. For stripping highly resistant paints—including epoxies—faster and more economically.



Pennsalt AE-16S—aluminum etchant in solid form. Dissolves quickly with minimum agitation, no heat of solution; maintains uniform alkali concentration. Dustless; handles easier, faster than flakes.

Ask your Pennsalt representative about these materials . . . and about the Pennsalt Plan, which integrates chemicals, equipment and service to make your finishing dollars go farther.

. . . a better start for your finish®

Pennsalt Chemicals®
ESTABLISHED 1850

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products finishing

Vol. 25 No. 5 February, 1961

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Member
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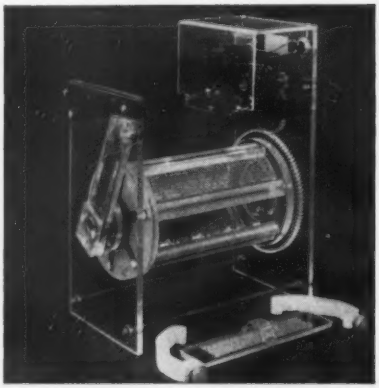
THE NEW STUTZ PORTABLE *PLATING BARREL* with CONE BUTTON CONTACTS



Offered for the first time, a Portable Plating Barrel with Cone Button Contacts. This type contact produces a perfect plating job on small delicate parts without distorting the parts. Barrel is of loose rib and panel design for easy replacement of parts, when necessary.

Units available in high temperature Plexiglas in either 6″ x 12″ I.D. or 8″ x 18″ I.D. sizes. Also special sizes upon request. Standard perforations are 3/32″, smaller or larger openings are available.

Stutz, the leader in Barrel Plating Equipment both in design and construction—present an entirely new barrel for use on the tub type automatic barrel plating machine.

The Stutz Barrel is constructed of high impact Polypropylene and welded into a solid unit. This resin is virtually indestructible and can be safely used in all solutions and temperatures.

Maximum perforations are provided and these are carried into the bottom skirt. Solution dragout therefore is reduced to the least possible amount and plating speed is exceptionally good.

Every user of this new barrel will testify that it is the finest contribution made in the operation of the tub type machine.

Write for catalog and prices

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products finishing

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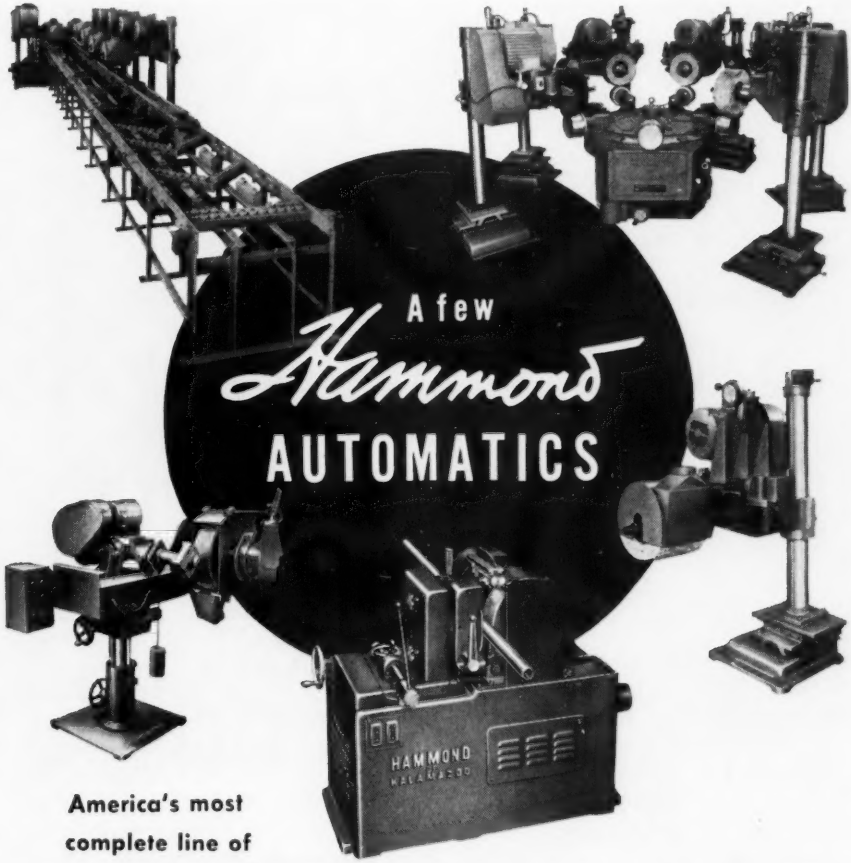
Circulation over 24,000— largest in the finishing field



America's most complete line of

POLISHING, BUFFING and DEBURRING MACHINERY

We offer a complete line of Turrets, both indexing and continuous, from 21" to 10' in diameter, and Strait Line conveyors in all styles and almost any length. The right finishing head for the job is available from 1 to 30 HP in floating or rigid types. Junior Automatics, "OD" Cylindrical Finishing Machines, and specials are available for high production finishing of household appliances, brass goods, automotive parts, plumbing supplies, etc. Ask for factory trained engineer to discuss your finishing problems — no obligation.

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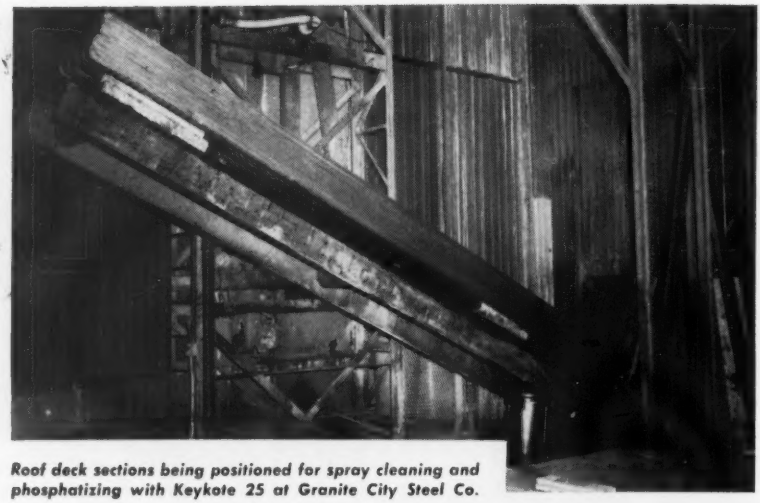

Roof deck sections being positioned for spray cleaning and phosphatizing with Keykote 25 at Granite City Steel Co.

Granite City Steel Co. relies on Kelite KEYKOTE® 25

for superior corrosion protection in the manufacture of their ribbed steel roof decking of noted high quality. Finishing is accomplished in one of the world's largest conveyor systems for paint preparation and painting.

Keykote 25 is a powdered composition which produces dense complex phosphate coatings from water solutions. While not an iron phosphate, it competes in that class. It embodies iron for ductility, zinc for galvanic protection, manganese for hardness and ferromolybdate for passivity. The result is superior performance at low cost.

Keykote 25 baths produce little or no sludge or scale. Solutions are easy to control and a single material is used for make-up and replenishment of the bath.

Application is by one to six stage spray washer, immersion, or steam phosphatizing methods.

For further information write the nearest Kelite Office listed below. Ask for Keykote 25 bulletin F21.

U. S. PATENT NOS. 2,557,509. 2,826,517, 2,885,312. OTHERS IN PROCESS. ALSO PATENTED IN CANADA, AUSTRALIA, AND GREAT BRITAIN.

KELITE CORPORATION

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by the electroplating industry

as the most modern and most efficient equipment

Albert Singleton
President

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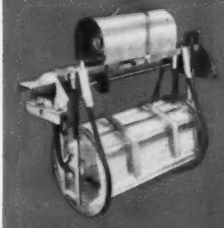
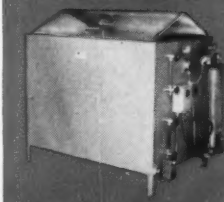
SINGLETON is now considered the unchallenged leader with over 14 years experience. The country's top distributors rely upon them for:

- Singleton (O. E. M.) Barrels
- Singleton Barrel Tanks with exclusive inverted-V or horn saddle contacts.



Singleton Barrel



Singleton Corrosion test cabinet

- Singleton Replacement Barrels
- Singleton Corrosion Test Cabinets of plain steel, stainless steel or H-T Plexiglas.
- H-T Plexiglas Baskets and Buckets
- H-T Plexiglas Lab Tanks

All equipment is custom-designed to exacting specifications with the famous Singleton fusion-welded construction. For the highest quality at the most reasonable prices and fastest service, contact your nearest distributor or The Singleton Company direct.

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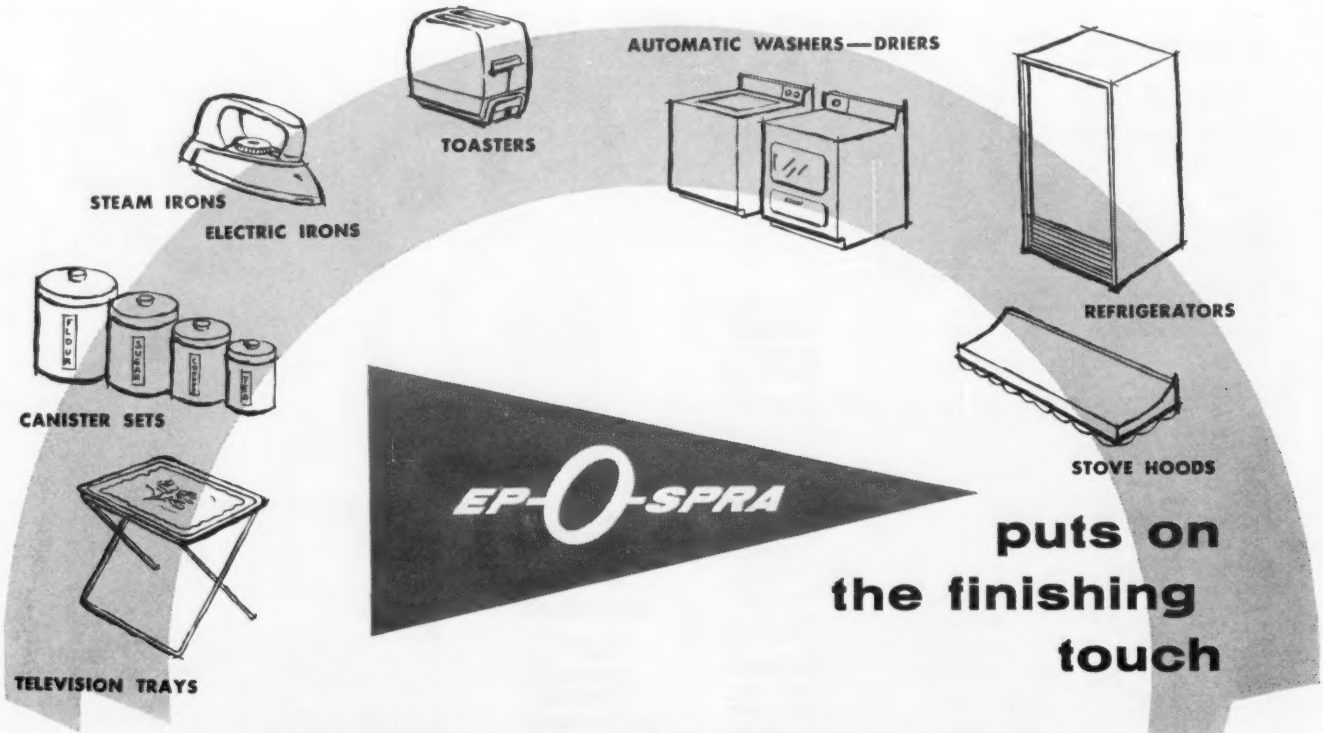

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sprays on...stays on!
all metals! all colors!

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. . . and Ep-O-Spra is just as much at home on appliances, business machines, metal furniture, outboard motors, bicycles and kitchenware—in fact, almost any product made from treated cold-rolled steel and bonderized metal, or any polished metal surface.

For information and samples, just send the coupon. A Lowe Brothers finishing engineer will visit you and demonstrate how Ep-O-Spra fits into your finishing picture.

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INDUSTRIAL FINISHES

Quality unsurpassed since 1870

Style-tested paints for Home and Industry

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PF-2

The Lowe Brothers Company
Dayton 2, Ohio

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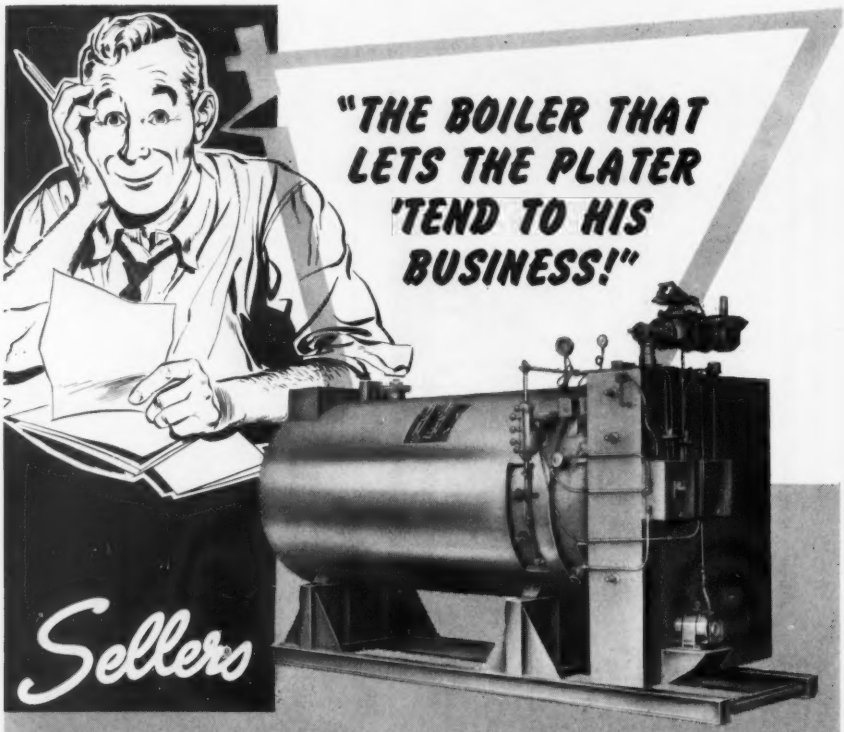

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- No open flame
- Simple design
- Positive pressure blower overcomes building vacuum and chimney back draft
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- Self-cleaning tubes
- No foul fumes
- Safe, complete combustion
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- Maximum heat transfer

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Sellers ENGINEERING COMPANY

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ANOTHER NORTON PRODUCT

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when a grease lubricated RESINALL METALITE belt was used to polish these stainless steel backsplashes for restaurant grills. An improved #4 finish was quickly achieved where formerly two operations were required. Find out more about speeding your production and improving quality with coated abrasive belts.

Write for the free booklet "Better Off-hand Polishing" to Dept. PF-2, BEHR-MANNING CO., Troy, N. Y., a division of Norton Company.

BEAR Abrasives

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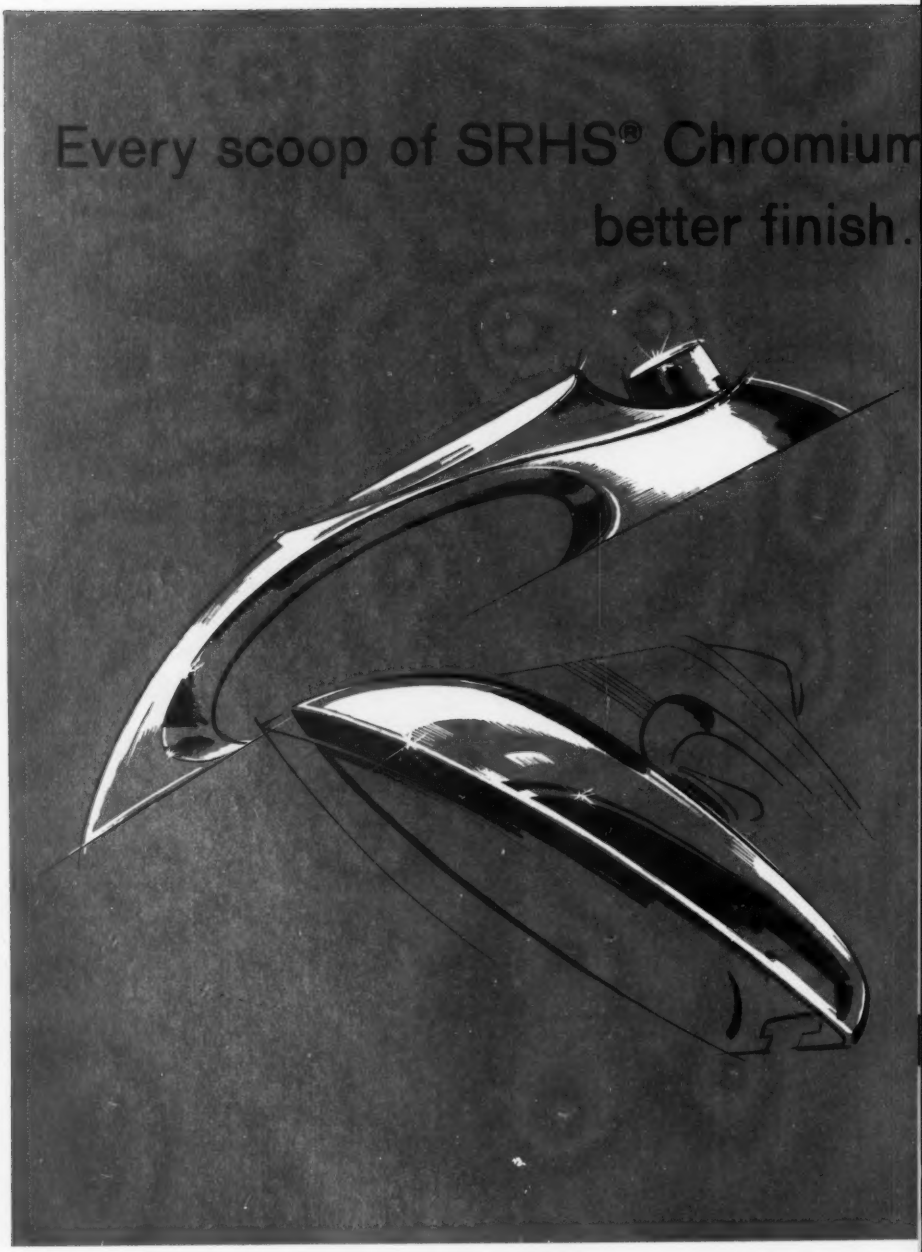
Every scoop of SRHS® Chromium
better finish.

offers

. faster plating . . . "automated" bath

PELLETS of SRHS Chromium Compounds are packed solid with valuable benefits. They provide the only chromium bath where important elements automatically control *themselves* for optimum plating balance. SRHS Solutions plate up to 80% faster than ordinary chromium, have wider bright plate range that cuts rejects from burning and missing. They take less power to turn out a given work load. They make it easier for you to plate complicated work shapes; also enable you to plate bright chromium on chromium, or on stainless steel.

You can now match your production requirements from a variety of specialized SRHS Chromium Compounds...including M&T Micro-Crack Chromium or Unichrome Crack-Free Chromium for bright or industrial work, and M&T "Duplex Chromium" for greatly increasing outdoor durability. Ask an M&T engineer to survey your plant and prove that plating chromium the SRHS way is your most profitable way.

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M&T **plating products**

METAL & THERMIT CORPORATION

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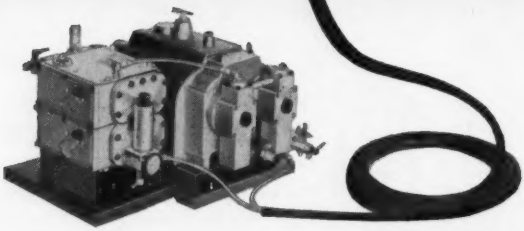


Versa-Gun used with
Nordson AP 15000 Unit.
The most advanced Airless
Spray System available.

NORDSON · ORIGINATORS OF THE AIRLESS SPRAY SYSTEM

"We are proud to announce a new breakthrough in Airless Spraying"

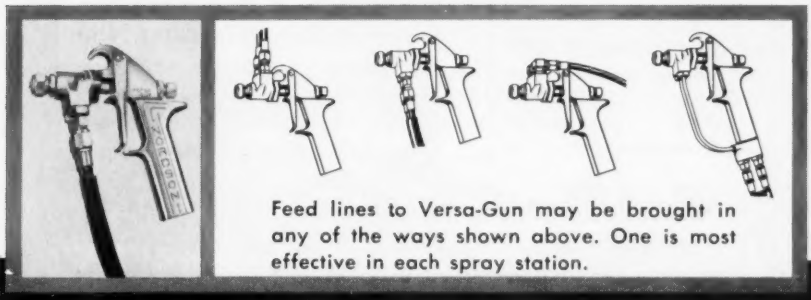
Eric Nord, President, Nordson Corporation

The effectiveness of any spray paint system depends largely on the efficiency of the spray gun. In the past, spray guns available were a bottleneck to maximum efficiency. That's why our new Versa-Gun is a vital breakthrough in the field. This new gun:

- **Is spit-free** because of improved design in the area between the valve and tip; because it opens faster – closes faster than other guns.
- **Small in size** – easy to get into difficult, hard to paint spots.
- **Light in weight** – only 16 ounces.
- **Easy trigger pull** – only 4.7 pounds at 500 PSI.
- **Excellent balance** – this added to size, weight, and trigger pull advantages result in better "handling;" thus reducing operator fatigue.
- **Improved atomizing characteristics** – this helps solve the problems of tailing and extends the operational range of the gun.

The Versa-Gun, as this name implies, is the most versatile spray gun ever developed for the Airless System. It may be used with heated or room temperature material, with circulating or dead-end systems. The Versa-Gun brings new effectiveness and economy to the entire range of airless spraying. We would like to show you how this new gun and the Nordson Airless System can go to work for you – save you money and help you do a better job.

Write for free copy of folder N-500 today. **NORDSON CORPORATION, 88 JACKSON STREET, AMHERST, OHIO.**



Feed lines to Versa-Gun may be brought in any of the ways shown above. One is most effective in each spray station.

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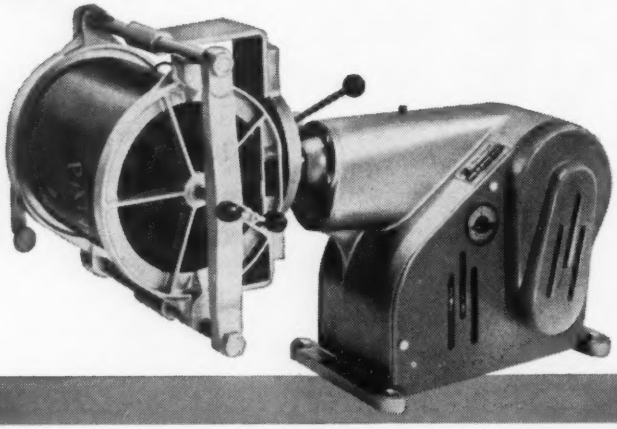
Save time, labor and paint with a

Red Devil
PAINT CONDITIONER



No. 33 Heavy Duty
For 1 to 5 gallon cans, also carton of four 1-gallon cans. Operates vertically or horizontally. Feather-touch clutch handle. Foot-pedal release.

No. 30
For any can ¼ pint to 1 gallon, U. S. and Imperial Standard.

Red Devil—Harbil HB7
"Twin" model shakes a pair of containers . . . from ¼ pint to 1 gallon . . . same size or two different sizes.

Whether you paint your product with brush, spray or dip, you're ahead in every way when paints are *thoroughly* mixed, and nothing mixes paints better than the EXCLUSIVE 3-WAY ACTION of a Red Devil Paint Conditioner. Rejuvenates settled-out paints; insures uniform color blend of new paints. Useful for plant maintenance painting too.

Write today for complete data. Adaptors available for containers of various shapes and sizes.

Red Devil Tools. UNION, N. J., U.S.A.

World's largest manufacturer of quality painters and glazers' tools — since 1872

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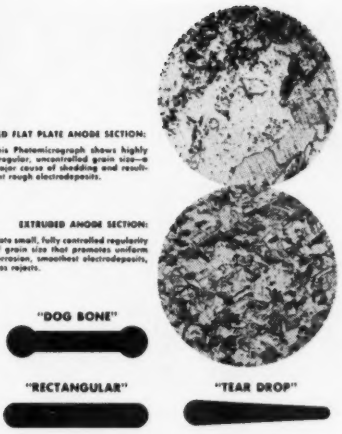
ROLLED FLAT PLATE ANODE SECTION:
This Photomicrograph shows highly irregular, uncontrolled grain size—a major cause of shedding and resultant rough electrodeposits.
EXTRUDED ANODE SECTION:
Note small, fully controlled regularity of grain size that promotes uniform corrosion, smoothest electrodeposits, less rejects.
"DOG BONE"
"RECTANGULAR"
"TEAR DROP"

these anodes are extruded and shaped to lower plating costs

These scientifically shaped anodes retain 80% of original active surface area after 85% by weight has been plated off!

Costs are lowered by prolonged anode life, minimized polarization and less silver scrap to be refined. In addition, the AP & S Extrusion Process controls grain size within definite ideal limits so that corrosion is smooth and uniform. Electro-deposits are consistently smooth. Shedding is virtually eliminated. Rejects are a comparative rarity!

We are anxious that the silver you buy in anodes is used most efficiently and economically. Special anode shapes will be engineered to meet your particular plating bath conditions. Call or write for a representative. We'll be glad to assist with your plating problems.

AMERICAN PLATINUM & SILVER DIVISION
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gold plating solutions for electrical - decorative applications

Recently, the use of gold electroplates have been extended to many new functional applications especially in the field of electronics where the tarnish resistance and low electrical resistivity of gold are most useful. A complete line of precious metal plating solutions for both decorative and functional purposes are available from stock.

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Atomic Number	79
Atomic Wgt.	197.20
Crystal Structure	Face center cubic 4.07A°
Density	20°C = 19.3 G/CM³
Melting Point	1063°C
Specific Resistance	13.2 OHMS/MILL/FOOT
Thermal Conductivity	0.71 c g s UNITS (20°C)
Coef. Linear Expansion	14.2 Micro Inches /°C (20°C)
Hardness	Rockwell 15 T Scale = 24
Tensile Strength	P.S.1 x 1000 = 18
Magnetic Susceptibility	.15 x 10^{-6} C.G.S. Units (18°C)

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☐ Extruded, Shaped Anodes ☐ Atomex

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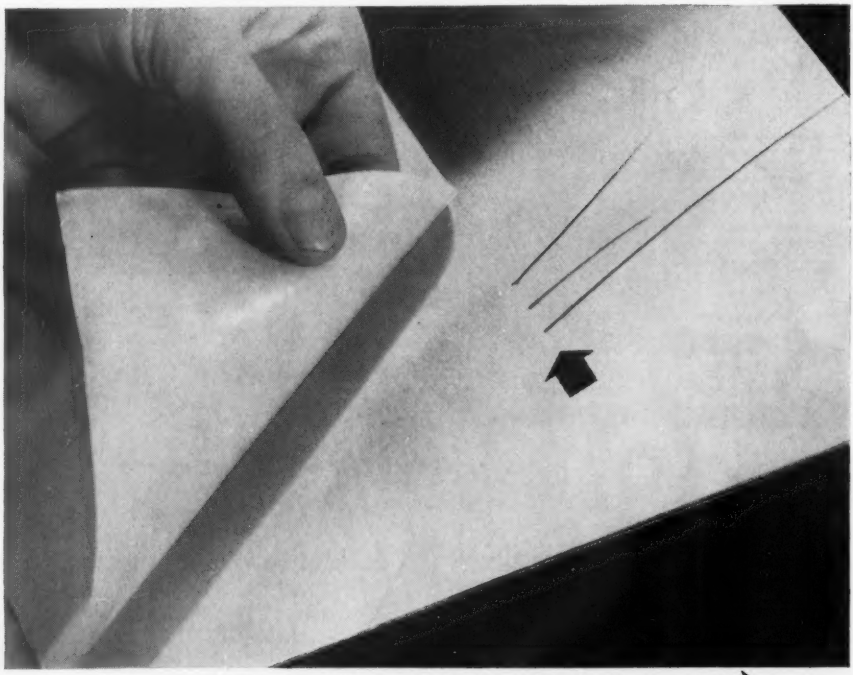

Protect shiny surfaces from costly damage with

MYSTIK BRAND

6100-B PROTECTO-MASK®

■ Half of the stainless steel sheet (shown in the above unretouched photo) was covered with Protecto-Mask. The other half was left exposed. Notice how the uncovered half was scratched—yet the part that was covered with Protecto-Mask is unblemished!

Protecto-Mask is a tough, self-sticking paper "skin" that is easily applied to any smooth surface. It protects polished or plated materials from costly scratches, gouges, oil marks and blows. And it peels right off, as shown above, without leaving any residue.

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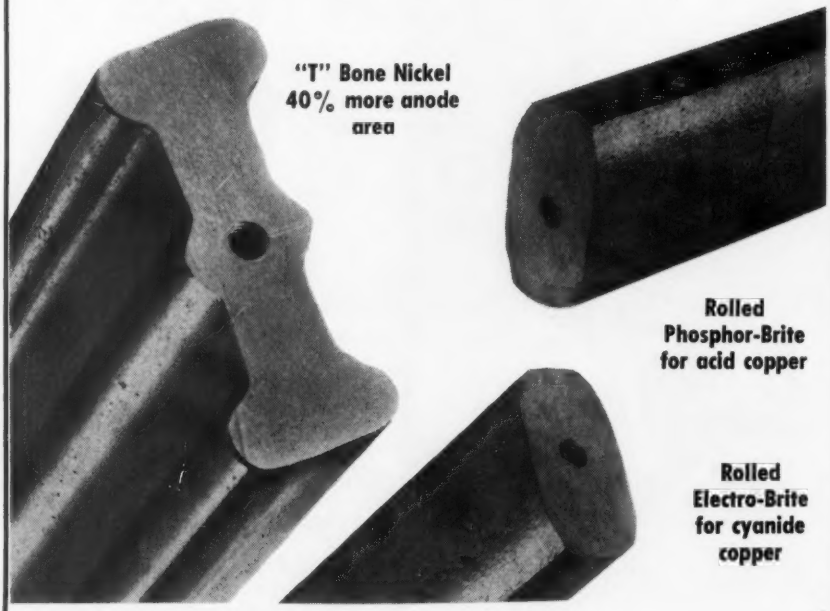

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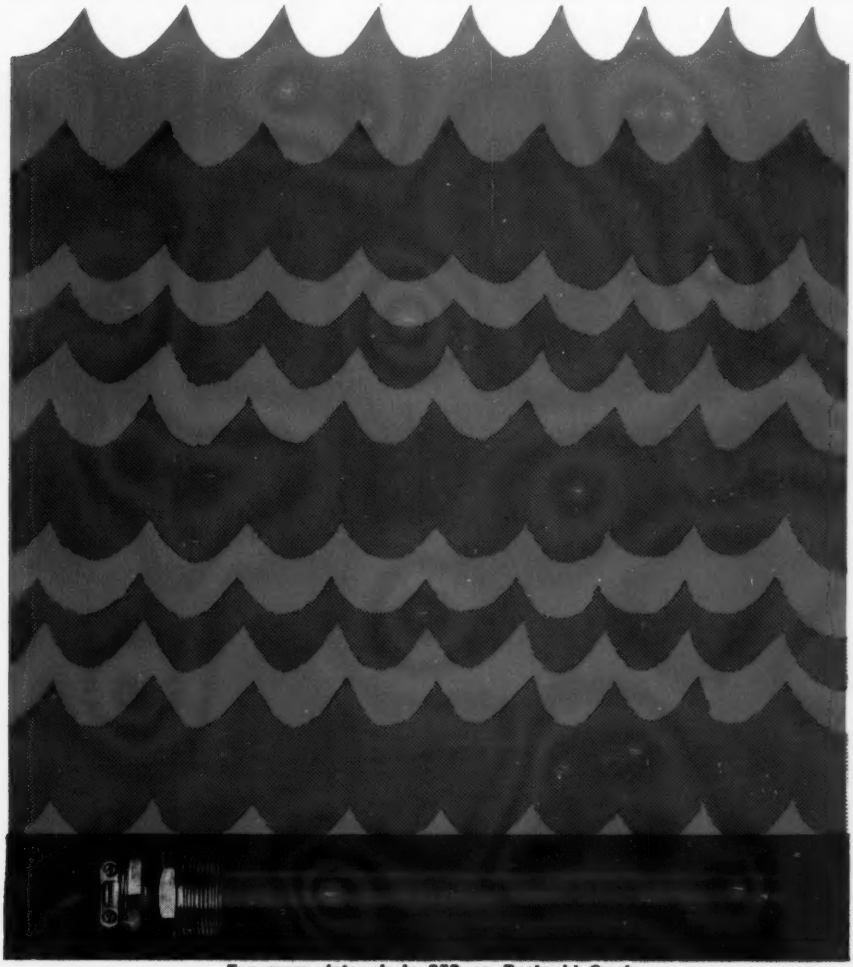

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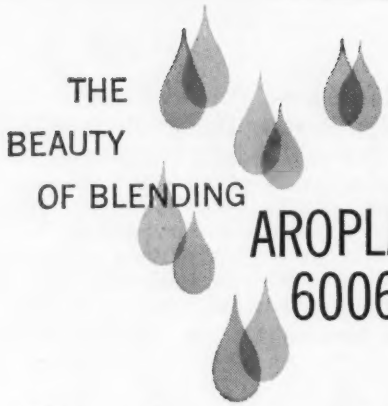

Reduce drying time to minutes... cut application costs.. enhance performance by modifying conventiona alkyds with ADM's remarkably compatible fast air-dry alkyd

The remarkable compatibility of AROPLAZ 6006 is cutting costs and solving problems in a host of fast air-dry and quick bake industrial applications. Auto refinishing king, Earl Scheib, whose nation-wide system of shops repaint half a million cars a year, cites a prime example: "Modifying a conventional alkyd with AROPLAZ 6006 enables us to reduce drying time 15 minutes on the average. Rejects and returns caused by water spotting, dust pick up, or paint failure have been virtually eliminated."

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Photo: Courtesy Earl Scheib, Inc., Los Angeles, California

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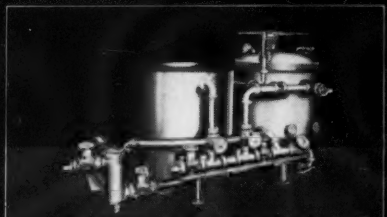

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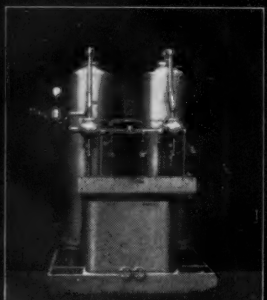

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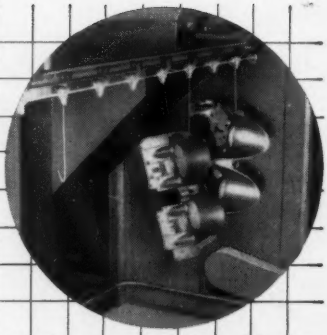


CAPITAL LOSS TURNED INTO PRODUCTION GAIN

from plant ruins to production records in sixty days

One of the toughest rebuilding problems confronting the Clements Mfg. Co. when their Deckerville, Mich., plant was completely demolished by fire, was speedy replacement of the finishing system needed for phosphate coating and painting of its diversified line of automotive diecast and sheetmetal parts.

The new system had to be versatile—had to handle many different sizes and shapes. It had to be inexpensive to operate fuel-wise and labor-wise. Above all, it had to be delivered and installed in a matter of a few days—it had to do a high quality job right from the start—and it had to take up little floor space.

Experienced MOCO design and process engineers rose to the challenge.

First, a 3 stage washing machine for phosphating and rinsing was designed and built at the MOCO plant, and shipped completely finished, except for piping hook-up, directly to the Clements Mfg. Co. plant.

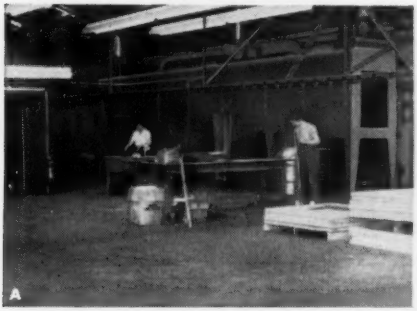
Next, MOCO engineers tackled the drying and paint baking problem. A combination Dry-off and Bake Oven was developed that could dry parts as they came from the washing machine on their way to the spray booths, and bake the painted parts as the conveyor returned them to the oven for a longer period before delivery to the conveyor unloading station.

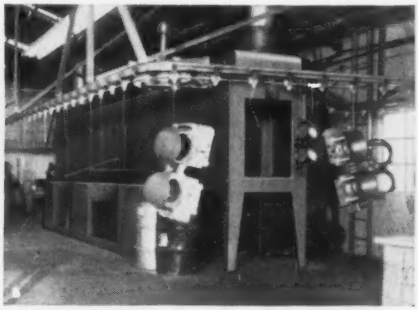
The Dry-off and Bake Oven was too large to ship already assembled, but MOCO's unitized design made assembly at the Clements Mfg. Co. plant a relatively simple matter.

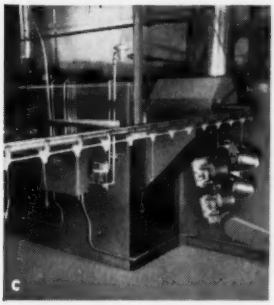
Within 60 days of the disaster, the Clements Manufacturing Company plant was back in full operation with production at a higher level than ever before, thanks to MOCO ingenuity, engineering skill and desire to serve its customers. MOCO problem-solvers will welcome the opportunity to serve you.

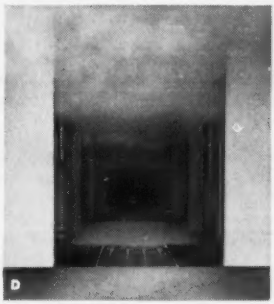
Write for the name of our representative nearest you.

FREE—Send for your MOCO bulletin showing typical finishing system applications and specifications; no cost or obligation, of course.









A—Sixty days after the Clements Mfg. Co. plant was burned to the ground this finishing system was in operation in the rebuilt plant. In the right foreground workers are loading and unloading parts. Behind them is the MOCO Washing Machine. On the left, paint spray booths hide the MOCO combination dry-off and paint baking oven. B—Start of the completely conveyorized finishing cycle. From loading station at left parts enter MOCO 3 stage washing machine for washing, rinsing and phosphate coating. C—Finishing parts coming out of combination dry-off and bake oven on their way to unloading station. D—Entrance view of phosphating machine indicating risers, nozzles, street els, drain decks, access walkways, spray zone silhouettes shown immediately after pump stopped. E—3 stage MOCO washing machine showing tanks, fill and overflow pipes and valves, pumps, burners, controls and exhaust ducts.

60-60A

MICHIGAN OVEN COMPANY

MOCO

FINISHING EQUIPMENT DEPT. 423 BRAINARD DETROIT 1, MICHIGAN

WASHING MACHINES • BONDERIZING UNITS • DRY-OFF OVENS • DIP TANKS
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COPPER PLATING PROCESSES

to fit your operations, your production and cost needs.

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Best for high-speed, full-bright finish on zinc die castings, steel, brass or bronze.

CONSISTENT MAXIMUM BRILLIANCE—Primary agent suppresses burning, secondary agent operates well in medium and low current density area; both contribute to overall brightness.

COMPLETE COVERAGE—Covers extremely well in low current density areas. Ideal for parts requiring deep throw; produces plate in deep recesses comparable to buffed areas.

ECONOMY—Plates uniformly over high and low current density areas to save on copper consumption. Easy analysis for brightener level.

ISOBRITE® COPPER #623 GENERAL PURPOSE

Ideal for shops with varied operations. Gives full or semi-bright plate on zinc base die castings, steel, brass or bronze.

EASY-TO-USE—A single addition agent for rack or barrel plating. Easily controlled for desired brightness level.

HIGHLY ECONOMICAL—Use as semi-bright at half the cost of full bright solutions.

VERSATILE—Easily buffed to cover wheel marks. Also brightens well in areas not easily accessible to buffing. Use in rack or barrel plating operations.

ISOBRITE® COPPER #625 BUFF BRIGHT

Produces a very soft plate for quick buffing.

A COMPLETELY ORGANIC SYSTEM—No metallic constituents.

VERY ECONOMICAL—Works well over wide variations of temperatures and concentrations.

EXCELLENT FOR STOP-OFF—Produces plate that resists penetration by heat-treating or case hardening.

VERSATILE—Use in cyanide solutions with or without tartrates, Rochelle salts or proprietary substitutes.

These Isobrite Copper Processes contain no lead and are ready to work as soon as current is turned on, even after week-end shut downs. This means increased production and substantial savings by eliminating poorly plated rejects.

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ISOBRITE #628-W High detergency type wetting agent for severe organic contamination. All our wetting agents are easily cleaned from parts to give good nickel adhesion.

See your Allied Field Engineer for complete information and recommendations for the specific process that best meets your requirements. He's listed under "Plating Supplies" in the yellow pages. Write for FREE TECHNICAL DATA FILES.

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Ask the Westinghouse Industrial Electronics Department, 2519 Wilkens Ave., Baltimore 3, Maryland, for information on how ultrasonics can solve your cleaning problem. You can be sure . . . if it's Westinghouse.

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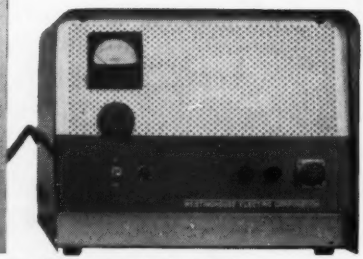

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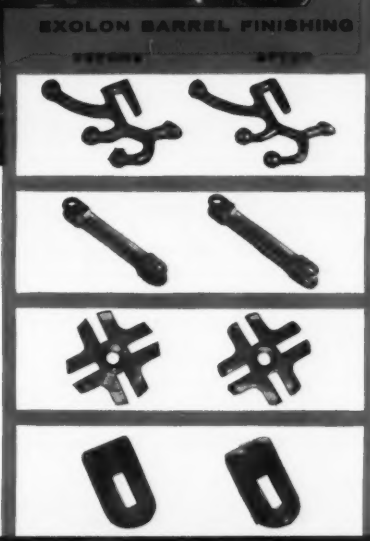

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H-VW-M's New, Improved Levelume 220 is the Brightest Idea Among Today's Bright Nickel Baths

If you're confused, move over. So are a lot of other people in the plating business who are wading through the jungle of competitive claims.

H-VW-M takes the tiger by the tail in introducing Levelume 220—repeat Levelume 220—a bright nickel finish better than the original Levelume and ready to tackle any bright finish *production* job.

Levelume 220 is one of three new job-proved nickel baths offered by H-VW-M, each tailor-made to meet specific finishing requirements.

Let's consider the advantages and characteristics of each.

SUPERLUME

Superlume is the premium bright nickel, the ultimate in brightness building with leveling. Superlume is for those users who want tip-top performance to meet the finest possible finishing requirements and are willing to spend a little more for the very best. The cost difference often can be recaptured in total finishing costs.

LEVELUME 220

Levelume 220 is a modified Superlume and is the brightest, highest leveling nickel available *at no premium cost*. Levelume 220 features high brightness with uniformity of brightness on all surfaces, high tolerance to impurities, excellent leveling or scratch-hiding. Levelume 220 is truly the workhorse of all bright nickel plating processes, and meets the requirements of most high-quality bright nickel plating at moderate cost.

PERMALUME

Easy-to-operate Permalume is a sulfur-free, semi-bright leveling nickel process for dual nickel or duplex systems. It has been thoroughly production tested in commercial applications, with excellent results. The Permalume bath is stable and can be filtered continuously through a carbon pack to maintain constantly favorable plating characteristics. It does not require periodic stripping to remove degradation products. Permalume permits continuous operation . . . no downtime for bath purification and replacement of expensive addition agents removed by treatment.

Levelume 220 is an ideal top coating for duplex systems using H-VW-M's new semi-bright Permalume as a base coat. The Levelume 220-Permalume combination provides maximum corrosion resistance, compatibility, activity, leveling and stability. For duplex coating on diecastings and steel stampings, this combination of star performers is unbeatable.

Levelume 220 is the clear-cut answer to bright nickel plating *at no premium cost*. For information and technical help, call on H-VW-M.

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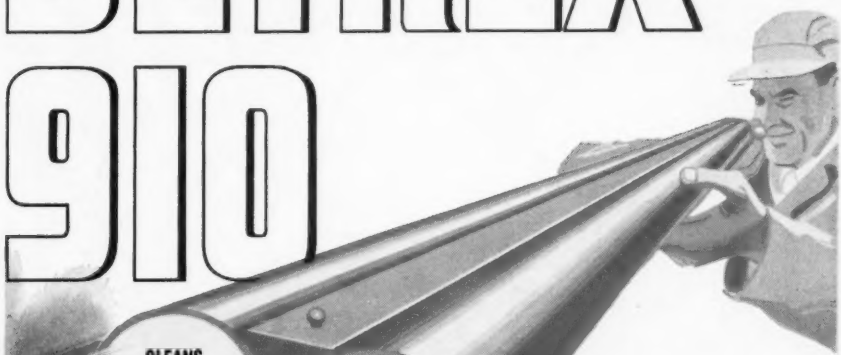

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ELIMINATES HARDWATER PROBLEMS—CONTROLLED PH

DOES IT WITH BOTH BARRELS

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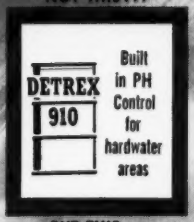

BUT THIS...

Here's a new approach to iron phosphate coating.

Detrex 910 chemically cleans and phosphate coats in one operation. It is designed for use in continuous mechanical spray washing equipment ranging from a 2 to a 6 stage operation.

ARE YOU IN A HARD WATER AREA? This field tested and fully guaranteed product is so compounded that it will accept at least fifteen times more alkali than other products and still remain in the PH coating range to produce superior iron phosphate coating. This unique alkali tolerance permits Detrex paint-bond 910 to be used in practically all areas of the United States without special PH control.

It's a "double-barreled" advancement that can mean important savings to you. Our field engineers will be glad to furnish the details.

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Large console cooling units can be accommodated, since the automatically operated vertical oven doors are 5' x 8'. For every oven need, consult KIRK & BLUM,. Write for new "Ovens for Industry" catalog.

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LEA COMPOUND — industry's pioneering greaseless abrasive compositions for burring, buffing, satin finishing, and flexible polishing; contains abrasives ranging from sharp, fast-cutting grits to fine, soft powders for delicate finishes.

LEA PLASTI-BRADE — flexible, fast-drying, liquid abrasive, burring, polishing and satin finishing compositions, available in a wide range of abrasive grit sizes.

LEABRAMENT — greaseless, non-flammable, quick-drying, liquid abrasive for burring and polishing; can be sprayed or brushed on wheels.

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LEAROK — fine abrasive compositions with "no free grease" designed primarily for buffing or coloring pieces which involve cleaning difficulties; does not pack up in recesses and ornamentations.

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The Hallmark of Quality Products

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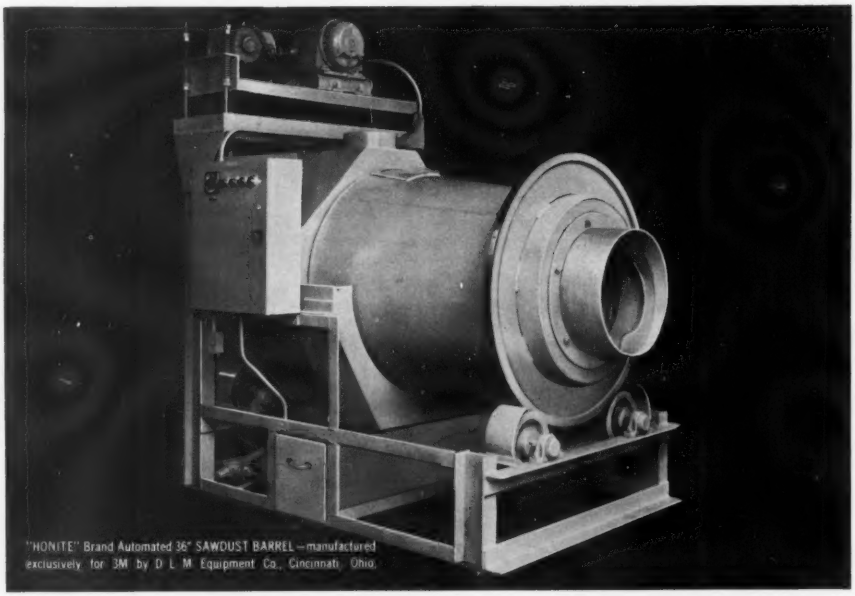

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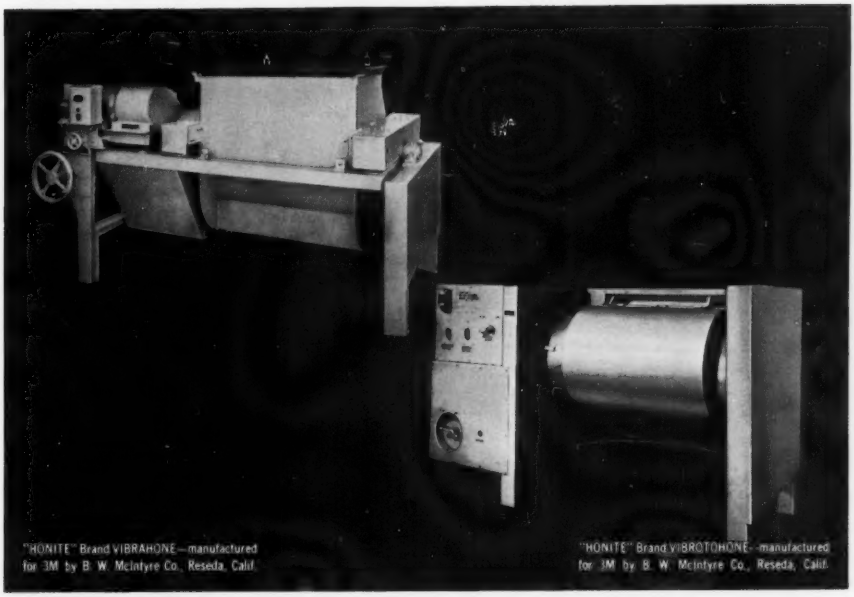

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. . . WHERE RESEARCH IS THE KEY TO TOMORROW

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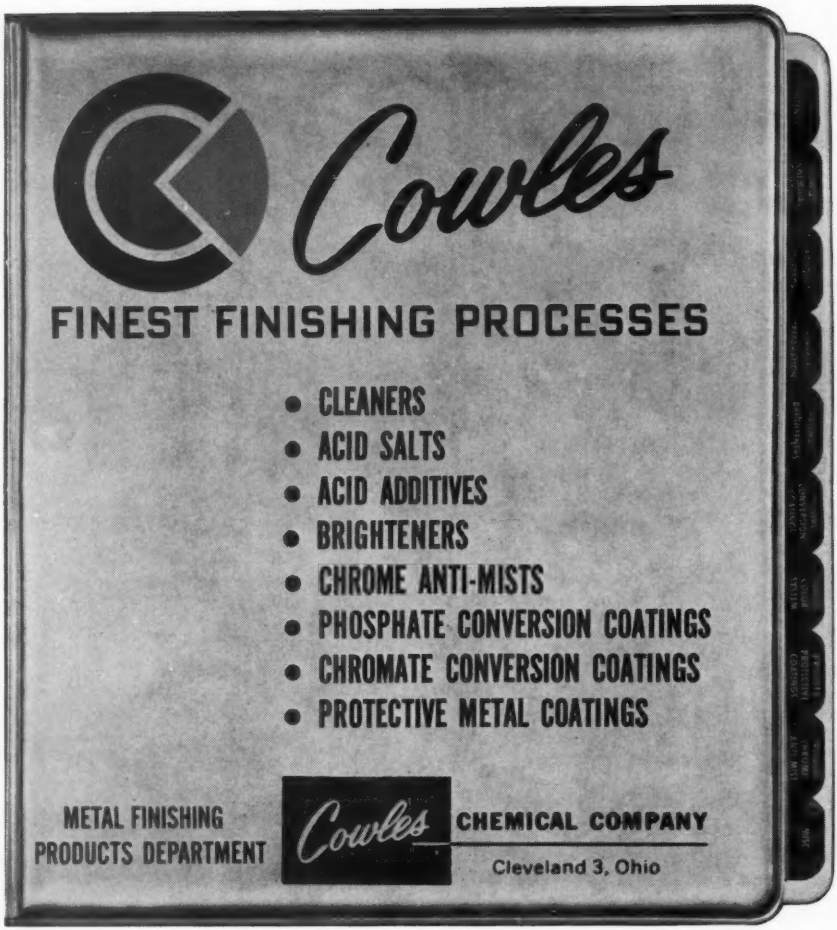

With new processes, plant facilities, and stepped-up research and development, the Cowles Chemical Company is aiming for increased coverage of the metal trades.

Object of the effort, which includes consolidation of the Promat Division with the Metal Finishing Products Department, will be to provide broader finishing capability to Cowles customers, according to C. C. Clabaugh, department manager.

Customers will get faster, better technical service from two new decentralized laboratories at Joliet, Ill., and Skaneateles Falls, N.Y.; sales headquarters will remain at the Cowles home office in Cleveland.

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editorial

Water, Dollars and Finishing

Water is an important raw material that's used in great quantities by the finishing industry. The cost of the water, however, does not always get the attention that other material costs receive. Yet with the population increase and growing industrial plant, water is becoming more expensive and less plentiful. We are told frequently that the "water table" is sinking lower and lower, and that the day of a real shortage is not too far away.

The fact that water costs are rising to important proportions is borne out by the fact that one large automotive plant has a process-engineering group with the sole responsibility of saving water throughout the plant.

One way that finishers can save water is by improving rinsing techniques. Not too long ago it was common for the plater to use one overflowing tank for a cleaner rinse, acid rinse and cyanide-copper rinse. It is possible that some shops still practice this system. Most plants, of course, prefer to use separate tanks for each rinse.

Another way to improve rinsing and save water at the same time is by counter-flow rinsing: in a series of rinse tanks the water flows from the last to the first tank, in the opposite direction to the travel of the plated parts. Counter-flow rinsing is further improved by introducing the rinse water at the bottom of each rinse tank.

More recently a conductivity control has been developed which automatically admits rinse water into a tank according to the concentration of contaminants. For finishing systems where the processing load is fairly constant, there are automatic valves which admit only a preset amount of water into the rinse tank in a continuous, controlled flow.

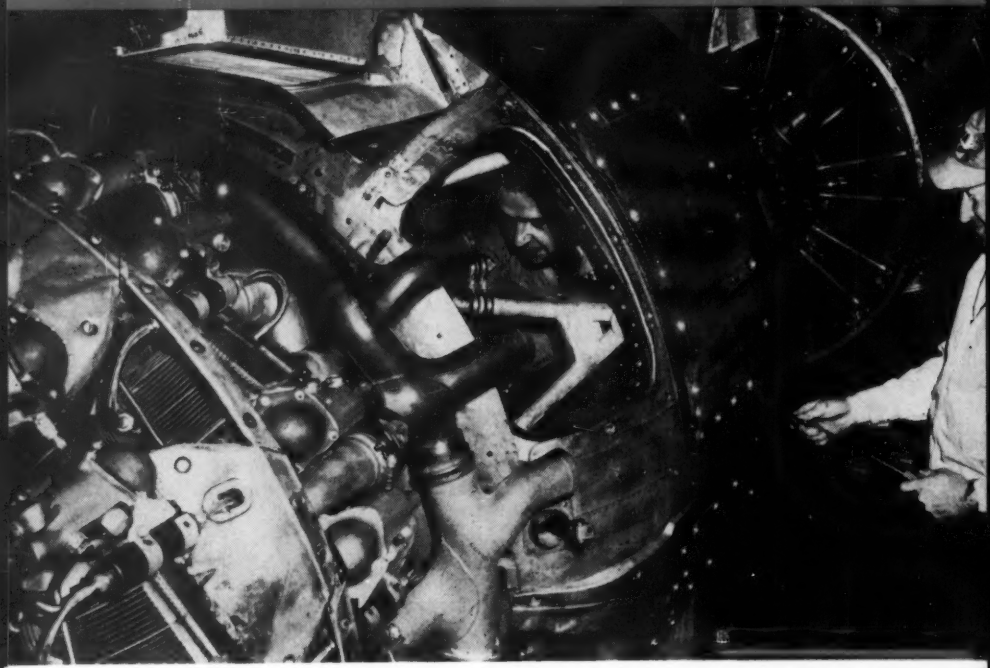
Finishers are finding that more thorough rinsing may be accomplished with less water if pressure-spray rinses are installed either in a "hand-tank" line, or in an automatic finishing system. The high-pressure sprays of water reach all surfaces of the parts and remove the surface film far more quickly and completely than an immersion rinse. A study of spray-nozzle design and placement may result in even further improvement in rinsing.

It isn't every day that you can save money and do a better job of finishing at the same time. A study of water use in your plant may reveal possibilities for process improvement — *and* saving.

Ezra A. Blount

—EDITOR

PLATING - A Vital Part of Aircraft Engine Overhaul



How T. W. A. plates critical parts used in rebuilding aircraft engines . . .

By EZRA A. BLOUNT
Editor

Commercial aircraft engines are operated for a specific number of hours before being removed from the aircraft for overhaul and reconditioning. During aircraft engine overhaul, the engine is completely disassembled, the parts are cleaned, inspected, routed for repair or replacement, and the engine is again rebuilt so that it's "as good as new."

Many plating processes are specified for different parts of the engine during the reconditioning process.

When Trans World Airlines moved into a new 30-million-dollar overhaul base in Kansas City, the plating department was installed in a new, carefully engineered, one-million-dollar plating plant. The facilities include equipment for various types of plating and equipment for treating water and waste. The plating department is 50 feet wide, 150 feet long, and has a 30-foot ceiling. Equipment for disposal of waste solutions and rinse water is in a separate building.

The facilities in the new plant feature the latest developments in plating, water treatment and waste

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Fig. 1—Receiving-shipping-inspection area of plating department. Baskets to be delivered to the plating department unload automatically from the transport conveyor and roll down the gravity conveyor shown in right foreground. Progressman in center is wrapping completed, inspected parts for shipment back to engine assembly. R. C. Garland, plating department supervisor, is at left.

"Inspectors determine the feasibility of replating parts and specify the type and amount of plating . . ."

treatment equipment. A steel slat floor forms the working level of the plant. All transfer pipes, fume ducts, filters, and drains are on the floor below. Some of the fume exhaust ducts are polyvinyl chloride plastic. White PVC tank linings are used in most of the tanks.

Each plating tank has its own individually controlled rectifier (or group of rectifiers) which furnishes 12 or 6 volts according to need. Each plating "system" is a unit or group, fitted with the equipment required for the specific operation, together with that needed for allied operations.

Preplating Inspection

An overhead conveyor transports parts in baskets from the engine disassembly and cleaning areas directly to the inspection area in the plating department.

Baskets of engine parts are unloaded automatically when they arrive at the plating room receiving and shipping station (Fig. 1).

The parts are removed from the baskets and given to the inspectors, who check the parts thoroughly. Inspectors determine the feasibility of replating parts and specify the type and amount of plating to be applied to various parts. This information is recorded on a shop routing tag which accompanies each part or group of similar parts.

Stripping Methods and Processes

Preparation of engine parts for replating generally involves the stripping of the remainder of the existing plate. Since so many metals are plated on various areas of engine parts, T. W. A. must maintain a number of different stripping solutions and processes.

Chromium is stripped from steel parts by making the part the anode in an alkaline pyrophosphate solution. Temperature, 120 to 140 deg. F. Voltage, 6 to 9 volts. The steel tank serves as the cathode.

Chromium is stripped from brass at room temperature with concentrated hydrochloric acid in a tank lined with PVC.

Silver is removed from steel parts by several methods. The part can be made the anode in a solution of sodium cyanide, sodium hydroxide and trisodium phosphate held at room temperature and agitated by air. The silver is removed and later recovered from the cathode sludge. Plain steel tank.

Silver may be stripped in a solution containing 24 oz./gal. of sodium cyanide and 8 oz./gal. of sodium nitrobenzene sulfonate. Temperature, 100 to 120 deg. F. Air agitation. Plain steel tank. Silver is recovered by plating it on stainless steel sheets and then peeling it from the sheets. The recovered silver is processed by refiners.

Silver also may be stripped from brass by immersion in a solution of 19 parts concentrated sulfuric acid and one part concentrated nitric acid. This mixture is usually operated in a crock or in a stainless steel tank. The solution can be warmed slightly to hasten the action.

Copper is stripped by one of the methods used for stripping silver.

Lead-tin, lead-indium, tin and lead are stripped from silver, bronze, or

brass bushings by one of two methods. All these metals or alloys except tin may be stripped in a mixture of two parts concentrated acetic acid and one part hydrogen peroxide (35 per cent or 100 volume) in a stainless steel tank. All these metals including tin may be stripped in a proprietary alkaline material at 180 to 200 deg. F. in a steel tank.

Cadmium is stripped by immersion in a room-temperature solution of 16 oz./gal. ammonium nitrate. Plain steel tank.

Nickel is stripped in the sodium cyanide. Sodium nitrobenzene sulfonate solution strips silver.

Plating Processes

Plating of aircraft engine parts involves various metals and plate thicknesses. Such an operation is difficult to mechanize or automate. Each part is almost a separate plating job in itself. This type of operation would not be economically feasible in the average job plating shop, but engine parts are so valuable that the cost of replating can be high and still account for a substantial saving in part cost and engine overhaul cost.

Some of the many parts requiring plating or replating are: knuckle pins, cam supports, propeller-shaft sleeves, main bearings, articulating rods, link rods, propeller shafts, crankshafts, bushings, exterior parts, piston rings and valve stems.

Since several different engines are overhauled at T. W. A.'s new aircraft engine overhaul plant, it is essential to replate the various parts according to the original specifications for the engines. Sometimes this means different plating operations for different types of engines.

The inspector's job is critical—he must specify the right kind and amount of plating for each part.

All the plating done in this plant may be called utilitarian. The plating is done to build up worn parts, or to provide corrosion resistance, or to produce a soft coating on parts that must be pressed together. Replacement of bearing metal surfaces is a major plating project.

Silver Plating

A number of specific examples of parts and plating methods can be cited. Steel knuckle pins are silver plated on the bearing surface areas, and hard chromium plated on the ends where wear may occur. The operations required are as follows:

1. Strip old plating or surface impurity as described previously.
2. Treat in derust solution.
3. Rinse thoroughly.

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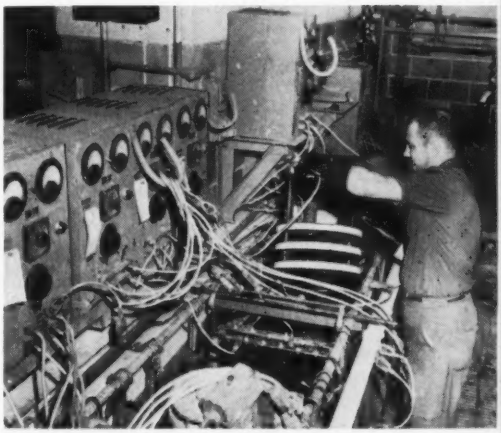

Fig. 2—Plater places rack of three cam supports in silver plating tank. Individual rectifiers (at left) make it possible to use exactly the specified amount of current on each rack of parts. This is essential in plating to the close tolerances required in this shop.

"The solution will deposit 0.006 inch silver per hour and plating can be timed to produce almost exactly the amount required."

4. Place knuckle pins in plastic plating masks fitted with polyethylene shields and washers.
5. Clean in reverse-current alkaline cleaner.
6. Water rinse.
7. Copper strike.
8. Water rinse.
9. Strip copper strike in reverse-current cyanide.
10. Dip in cyanide solution.
11. Water rinse.
12. Copper strike.
13. Silver strike.
14. Silver plate in concentrated high-metal solution containing 80 to 100 g./l. of silver. Sufficient silver is deposited so as to leave a thickness of 0.015 to 0.020 inch for shot peening.
15. Dragout rinse.
16. Rinse containing rust inhibitor.
17. Shot peen silver plated areas to check bond between silver and steel.
18. Rerack and chromium plate ends of knuckle pins to a thickness of 0.004 to 0.005 inch before machining. Chromium cycle as described.
19. Bake pins in oven at 350 ± 25 deg. F. for 3 hours to remove hydrogen.
20. Return to machine shop for machining to size.

In a somewhat similar manner, steel cam supports are stripped and then silver plated to a maximum of 0.020 inch thick on the o.d. or bearing surfaces.

Plating process for the cam supports is as follows:

1. Vapor degrease.
2. Rack on specially designed plastisol-coated racks.
3. Wet blast.
4. Copper strike in conventional cyanide copper for 2 minutes.
5. Strip the copper strike coat using reverse current in a sodium cyanide solution.
6. Water rinse.
7. Weak hydrochloric acid rinse.
8. Water rinse.
9. Dip in a 6 oz./gal. solution of sodium cyanide.
10. Strike in conventional cyanide copper solution for 2 minutes.
11. Water rinse.
12. Silver strike for $1\frac{1}{2}$ minutes. Racks charged during loading and unloading.
13. Silver plate (Fig. 2) in silver solution containing 50 g./l. of silver. Temperature, 85 deg. F. Current density, 30 a.s.f. The solution will deposit 0.006 inch silver per hour and plating can be timed to produce almost exactly the amount desired. Sufficient silver is deposited so as to leave a thickness of 0.010 to 0.016 inch after final machining. Solution is agitated by a mechanical stirrer in each end of the tank. Solution is filtered continuously at the rate of 2,000 g.p.h. Tank is lined with PVC. Anodes are silver slugs in a stainless steel basket bagged with Dynel cloth.
14. Reclaim rinse.
15. Water rinse.
16. Final water rinse containing a rust inhibitor.

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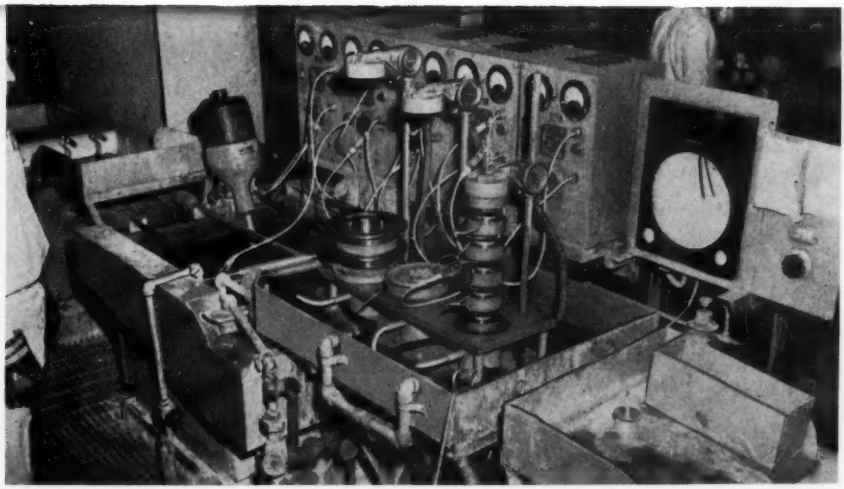
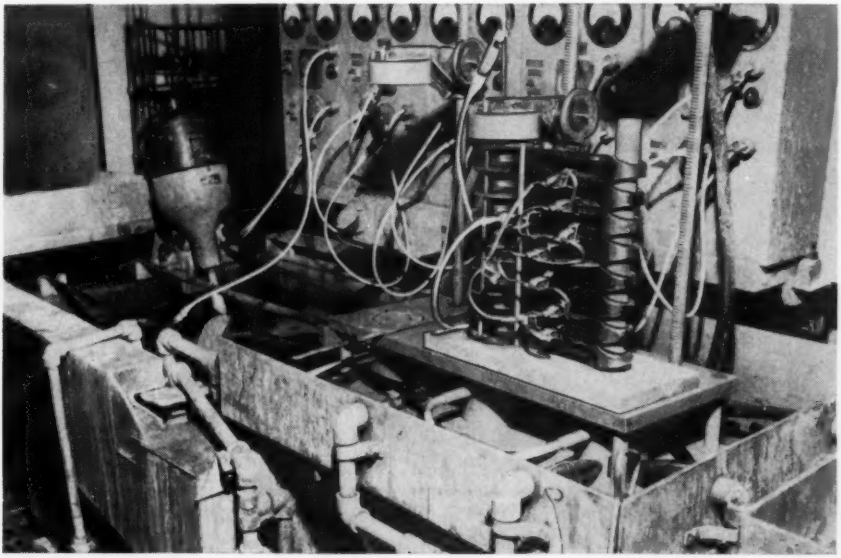


Fig. 3—Installation for lead-tin plating consists of plating tank proper, equipped with stirrer (left) and table for "pump-through" setups (center). Five reduction gear pinion bushings are being plated at once in the pump-through setup shown. Operator is in process of assembling a similar multiple plating setup for propeller shaft support bearings. Individual rectifiers are available to supply the specified current to each setup or to the plating tank. Regulator controls temperature. Tank and plating areas are PVC lined.

Fig. 4—Pump-through plating setup for plating lead-tin on bushings. Eight articulating rods can be processed at one time. Battery clips are used to connect each rod to the rectifier. Another battery clip on a common anode completes the circuit.



"An ingenious installation is employed in the lead-tin alloy plating of engine parts."

17. Unrack and return to inspector for checking and shipping to machine shop.

An effective adherence test is used to be certain that heavy silver coatings on interior surfaces are tightly adherent. A steel chisel is applied under the edge flash of the plate and an attempt made to lift off the silver plate.

After silver plated areas are machined to the proper dimensions, the cam supports are returned to the plating department so that 0.0004 to 0.0006 inch of a lead-tin alloy can be deposited over the silver to form the bearing-contact surface. The plated areas are then masked and the remaining steel surface is flash plated with copper.

Lead-Tin Plating

The silver bearing surfaces of steel propeller shaft sleeves are plated on the inside diameter with a lead-tin alloy to a thickness of 0.0004 to 0.0006 inch on a side. Old lead-tin is stripped from the part. The silver surface is then burnished until it is smooth.

Plating is done in a 93-7 lead-tin fluoborate solution. Using continuous agitation and a current density of approximately 30 a.s.f. an alloy plate thickness of 0.0004 to 0.0006 inch is deposited in 4 to 5 minutes.

An ingenious installation is employed in the lead-tin alloy plating of engine parts. Figure 3 shows the equipment used to plate reduction gear pinion bushings, five at a time, with from 0.0004 to 0.0006 inch of the 93 per cent lead, 7 per cent tin alloy. The bushings are first silver plated on the inside and outside diameters so that a 0.01 inch thickness of silver remains after machining. They are then prepared for the alloy plating as follows:

1. Degrease.
2. Vapor blast.
3. Water rinse.
4. Fluoboric acid rinse.
5. Mount in racks for the lead-tin alloy plating cycle.

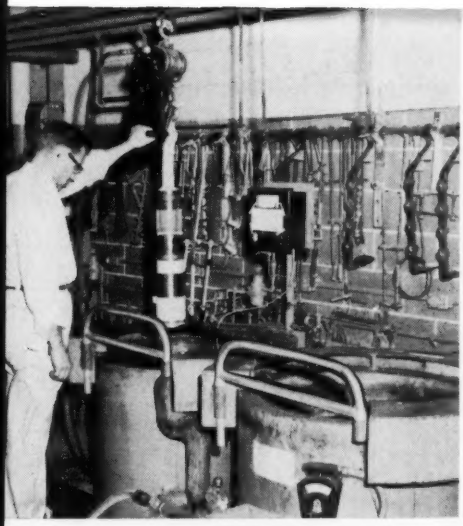
The bushings shown at right in Fig. 3 are separated by PVC spacers with rubber gaskets which fit tightly and mask all but the surfaces to be plated. A lead-tin alloy anode rod fits down through the center of the assembly. The bushings themselves (plus the spacers) form both the plating tank and the cathode. During plating, the fluoborate solution is pumped from the plating tank proper through a filter and then through the stack of bushings back to the tank.

Articulating rods and link rods are fitted with new bronze bushings during overhaul. The inner surfaces of the machined bushings in one end of each rod are then plated with a lead-tin alloy to within 0.0001 inch of the correct diameter. Figure 4 shows a universal jig setup for plating the bushings in eight link rods at one time.

Parts which are shaped so that they may be plated in the lead-tin plating tank are racked as necessary and plated in the tank. This operation is so well designed that mechanical masking may be used for 95 per cent of the work.

Lead and Indium Plating

To provide lubrication for more



extended service, lead-tin or lead-indium deposits are used on silver-plated engine bearings. A lead fluoborate solution and an indium cyanide plating bath are employed. The successive deposits of lead and indium are alloyed by baking in an oven following the plating operation. Plating facilities for bearings include plating tanks and special pump-through jigs and mechanical masks.

Hard Chromium Plating

Hard chromium plate is applied to propeller shafts or crankshafts on journal areas to rebuild worn bearing surfaces and at the same time provide

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Fig. 5—Operator lowers a propeller shaft into the hot wax tank to begin wax masking process. Areas to be plated have been protected with tape, which will be removed after waxing is completed. Propeller shaft is attached to special plating hook. Entire assembly is lowered into wax by motor-driven hoist. Wax temperature is controlled.

Fig. 6—An actuating cylinder for aircraft controls—racked, insulated, and prepared for hard chromium plating—is placed in the chromium plating tank. Rectifiers for this area of the plant are mounted on elevated platform along wall adjacent to the plating tanks. All exhaust ducts are routed below the plant floor to the sides of the room.

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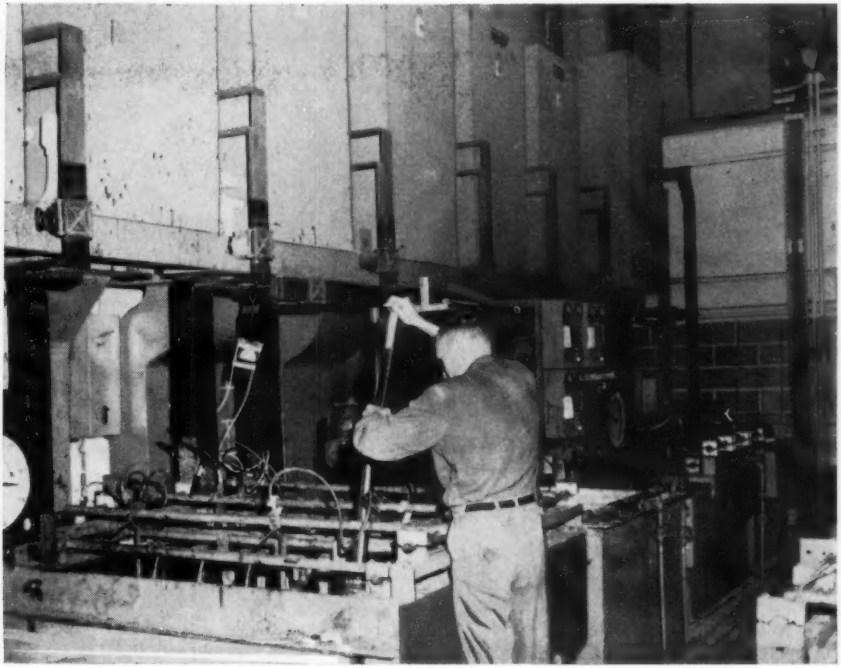


a smoother, more wear-resistant surface. The areas are ground undersize, plated oversize, and then ground down to the correct size.

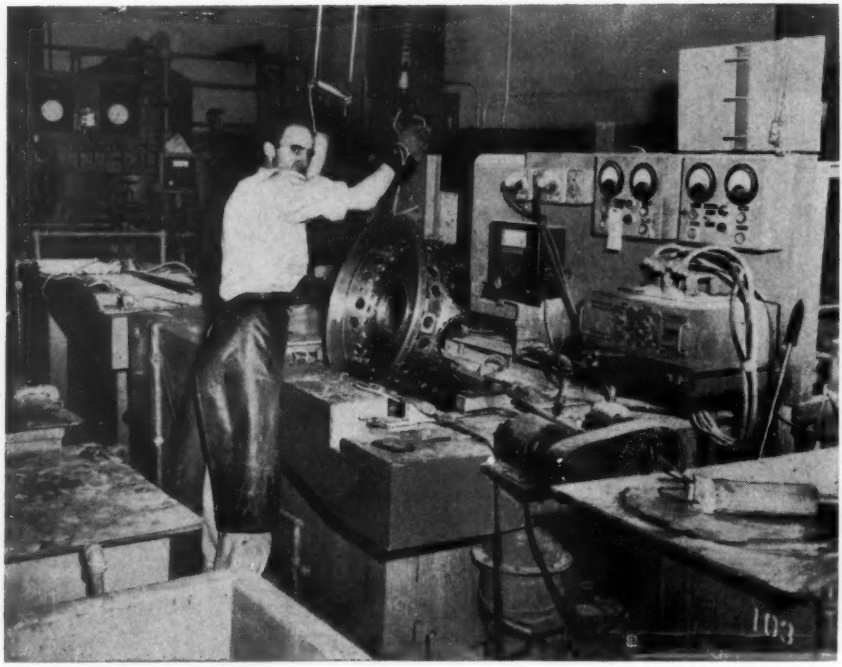
The chromium plating unit consists of one 700-gallon tank and two 300-gallon tanks. Another 300-gallon tank is used for the reverse etch prior to hard chromium plating.

The parts are insulated or masked prior to plating. Surfaces on which no chromium is desired are insulated with wax. Three wax tanks are used in this masking process:

1. Degrease part to be plated and attach racks or hooks.
2. Electroclean.
3. Apply masking tape on areas to be chromium plated.
4. Dip in the hot wax tank (225 deg. F.) to warm part and apply first coat (Fig. 5).
5. Dip in one of the two lower-melting-point wax tanks (175-185 deg. F.) for 3 to 8 times to apply successive coats of wax.
6. When proper thickness of wax is obtained, allow part to cool, then remove tape and wax from areas to be plated.

Waxed or insulated and racked parts are then dust blasted with very fine silicon dioxide, then wet blasted to further clean the surface. Parts are next given a reverse current etch in a standard chromium plating solution. They are then transferred to the plating tank and hard chromium

Fig. 7—Operator lowers EA-2 power case into cyanide copper plating tank. Since many of the engine parts are bulky and heavy, overhead cranes and motorized hoists are available for lifting the parts. Automatic temperature regulators and periodic reverse units are shown in right foreground. In background is the deionizing installation used to remove harmful minerals from most of the water used in the electroplating plant.



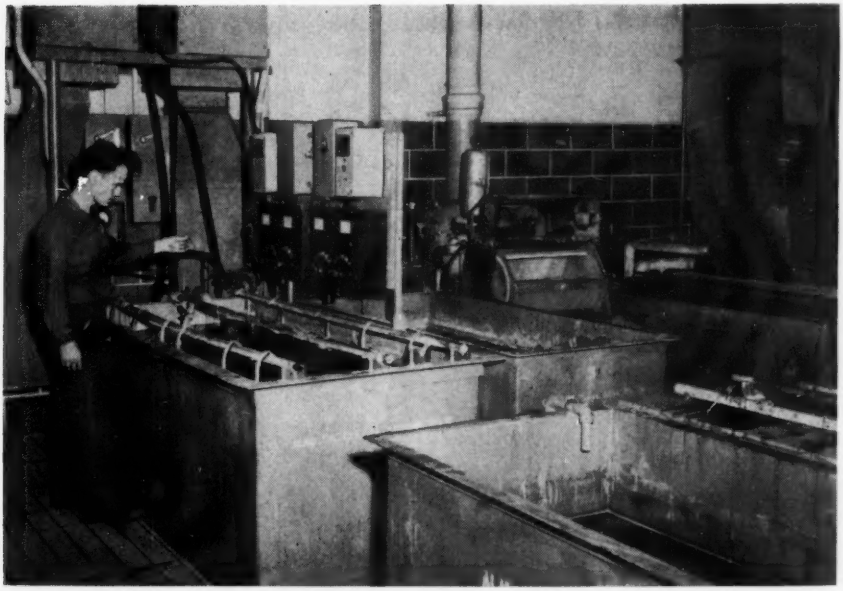


Fig. 8—Installation for cadmium plating engine parts. Facilities for barrel cadmium plating are also available. All tanks are numbered and labeled for easy identification.

plated in a CR-110 solution at 130 deg. F for the time necessary to build up the desired thickness of chromium (Figure 6).

Following plating, wax is removed in boiling water. Plated parts are baked for 1 to 23 hours at 375 plus or minus 25 deg. F. to remove any possible hydrogen embrittlement.

The chromium plating solutions are agitated before each shift to be sure that the temperature and solution are uniform throughout the tanks. The tanks are lined with PVC. Lead and tantalum heating and cooling coils connected to automatic temperature regulators keep temperatures uniform. Some exhaust ducts are made of steel protected with acid resistant paint; some are made of polyvinyl chloride plastic.

Copper Plating

Certain bushings need to be plated so that a pinch fit may be obtained on assembly. Copper is plated on the bushings from high-speed potassium cyanide copper solution until the necessary thickness is obtained.

Engine power cases are copper flashed to prevent scoring on the cylinder pads during assembly and engine operation. The plating process:

1. Electroderust, using periodic-reverse current.
2. Water rinse.
3. Copper flash 4 to 5 minutes in potassium cyanide copper plating bath (Fig. 7) at 125 deg. F. Periodic reverse current is employed. Cathode is agitated. Solution is filtered continuously.

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"One of the more complicated cadmium plating jobs is the protection of oil tubes . . ."

4. Water rinse.
5. Hot water rinse.

Cadmium Plating

Cadmium is plated on certain parts for protection against corrosion. Thicknesses from 0.0001 to 0.0007 inch are applied (as required).

One of the more complicated cadmium plating jobs is the protection of oil tubes, which must be cadmium plated inside and out. This involves the use of an auxiliary anode. Plating process is as follows:

1. Degrease.
2. Strip any residual cadmium in ammonium nitrate strip tank.
3. Water rinse.
4. Alkaline derust.
5. Water rinse.
6. Cadmium plate (Fig. 8) in standard cadmium cyanide bath, using a brightener, to a thickness of 0.0003 to 0.0005 inch. Room temperature. Current density, 15 a.s.f.
7. Water rinse and dry.

Cadmium (and silver) plated parts are baked for three hours at 375 deg. F. to prevent hydrogen embrittlement and at 250 to 900 deg. F. in special cases.

Tin Plating

Piston rings are tin plated with

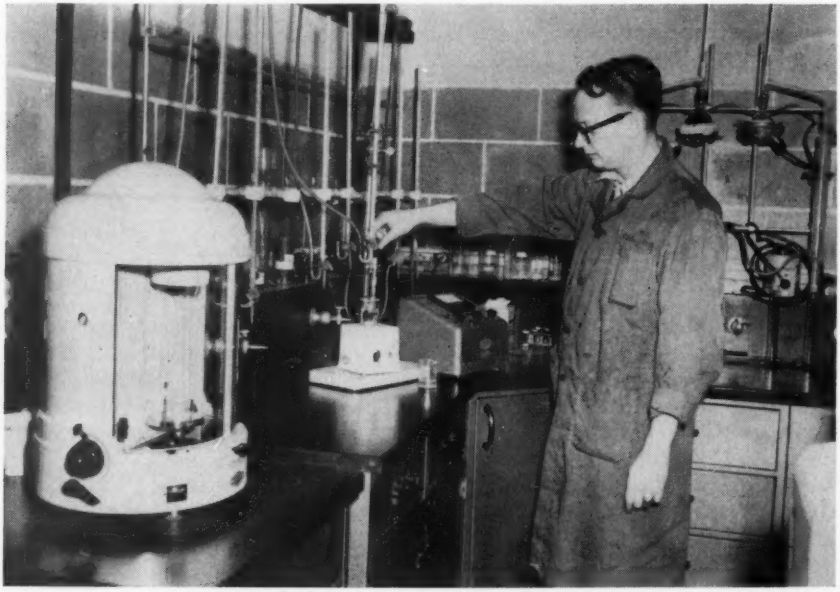

Fig. 9—R. L. Garrett, control chemist, performs an electrometric titration in analyzing a plating solution. Shown in foreground is a Sartorius automatic direct-reading balance, and in background, a Beckman pH meter. Equipment shown is typical of the analytical equipment in this control laboratory. All plating solutions are carefully controlled.

ANALYSIS AND ADDITION CARD

Date	Tank No.	Solution			Tank Capacity
Material		Results of Analysis	Composition Limits	Required Addition	Date and Initials of Person Making Addition

Analysis Made By

Approved By

Note:
No addition to be made unless approved by foreman or department head.

TWA Form # PP-36, 4-55

Fig. 10—Analysis and Addition Record Card shows additions made to each solution as well as specified composition limits for each ingredient in the solution. A control record of this kind enables the department supervisor and the control man to know the history of each solution, and determine that the composition of each solution is correct.

0.0002 inch of tin to serve as a lubricant. Roller bearing races are also tin plated to obtain the proper fit in assembly. A sodium stannate plating solution is used for this work. It was selected for its ease of maintenance and the wide variation in operating conditions under which it will still produce a specification deposit.

Flash deposits of silver or tin are applied to many parts to prevent corrosion and scoring in service. Lead deposits are also used to provide lubrication on certain parts during "break in."

Valve stems are lead plated to a thickness of 0.0004 inch in a lead fluoborate solution. This coating provides engine lubrication.

T. W. A. designs and builds its own racks and jigs for the many kinds and shapes of parts which are plated. Heat-cured plastisol rack coatings are used to insulate the plating racks and for masking. Cast rubber masks and plastic masks are used also. Parts are masked with paper, flat back masking tape, plastic tape, lead tape, aluminum tape, lacquers, and other materials.

Analysis and Control

Accurate chemical analysis of the many different solutions in use in the large T. W. A. plating facility, and strict process control are essential to efficient, successful operation. Analyses are made on a regular basis (Fig. 9) and the results recorded on permanent record cards (Fig. 10). Required additions to each solution are carefully specified and close control is kept so that the proper amounts of the correct ingredients are added. Some solutions are of such a nature that they must be replaced

(continued)

"Deionized water is used in all plating solutions, all cleaning solutions, and some rinse solutions."

Materials	Stock #	Amount	Make-Up Record	
			Date	By
Special Instructions:				
Change Solution Every____Weeks_____				
Tank #	Name:		Capacity:	Gal.

Fig. 11—This card record was devised for keeping track of solutions that are used and discarded regularly, with no intermediate chemical control measures required.

after a specified period of use. A system of records ensures that these solutions are discarded and built up from new materials (Fig. 11).

Water and Waste Treatment

Deionized water is used in all plating solutions, all cleaning solutions, and some rinse solutions.

A large waste disposal plant is in use at T. W. A. The waste treatment facilities are a short distance from the plating plant. Acid rinses and wastes and alkaline rinse water and waste are carried in two separate lines to retaining pits at the waste disposal plant.

Water containing cyanide and alkalies is collected in one storage tank in the basement of the waste treatment plant. Water containing chromic acid and other acids is stored in a separate tank. These tanks (retention basins) will hold up to 25,000 gallons each.

Cyanide wastes are pumped from the retention basin into a three-minute treatment basin. Here treatment with chlorine and caustic soda converts the harmful cyanide to a harmless form (cyanate). The waste is then pumped into the two-hour basin where the cyanate is converted into sodium bicarbonate and salt. This mixture is then transferred into the settling basin (or Cyclator®) clarifier where it mixes with the stream from the other part of the waste disposal plant (Fig. 13).

Waste water containing chromic acid is pumped from the retention basin to a chrome-reduction basin. Here it is treated with sulfuric acid and ferrous sulfate. This reduces the chromic acid to chromium sulfate.

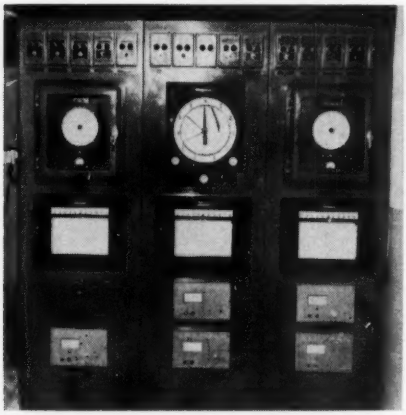

Fig. 12—Control panel in waste disposal plant. Recorders show rate of feed of chlorine into cyanide-containing waste, pH of cyanide waste, pH of chromium-containing waste, pH of plant effluent (must be between 8.0 and 10.0), pH of mixing and settling basin, and other data needed for records.

The material is then transferred to the lime mixing basin in which a hydrated lime is added to the mixture. The waste is now moved into the settling basin (Cyclator®) clarifier where crushed limestone is added. Chromium and iron compounds precipitate and settle to the bottom of the basin. A sludge pump moves this precipitated waste to a large lagoon where it is dried and removed periodically. The water in the settling basin flows over a weir and is discharged into a small stream nearby.

ACKNOWLEDGMENT

The author acknowledges with sincere thanks the assistance and cooperation of Robert C. Garland, plating foreman, and Robert L. Garrett, control chemist, in securing the information contained in this article.

Fig. 13—Cyanide treatment basin (foreground) is outside the waste treatment building. Cyclator® or settling basin is behind cyanide treatment basin. Crushed limestone is added, chromium and iron compounds are precipitated. (Photo by PRODUCTS FINISHING)

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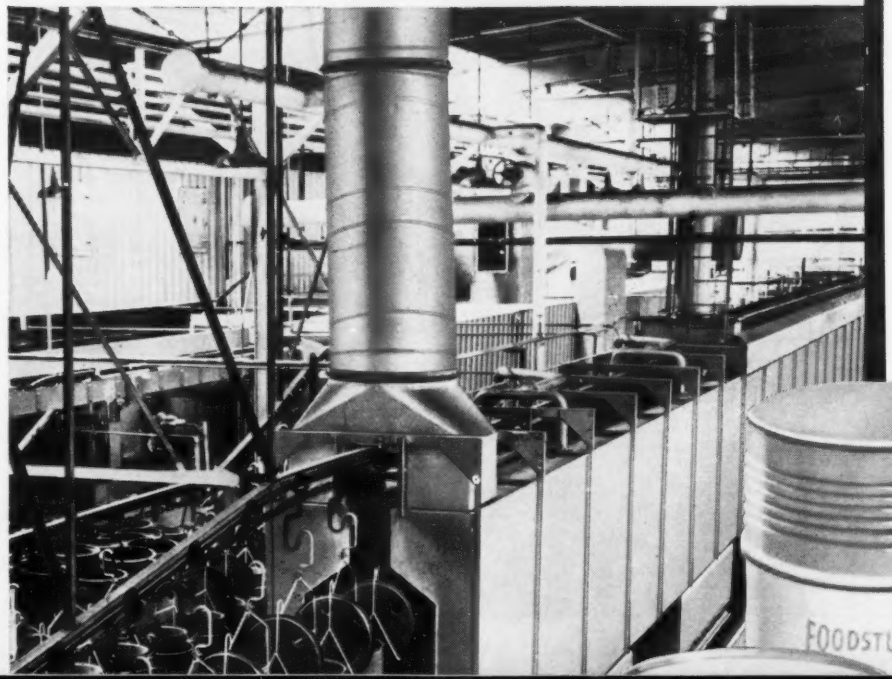

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That's what it takes to feed the plating lines at Chevrolet's Livonia, Michigan, Spring and Bumper Plant . . .

Keeping Chevrolet assembly plants supplied with bumpers requires the services of three huge automatic plating machines that can turn out a total of 10,000 chromium plated bumpers per 8-hour shift when operating at capacity. The Meaker "Straight-A-Way" plating lines have kept pace with Chevrolet production ever since the company's sales outstripped production facilities in Detroit during 1954, necessitating construction of the Livonia plant.

(continued)

Fig. 1—Display of bumper parts that have been plated by electroplating line at Chevrolet Spring and Bumper plant in Livonia, Michigan. Largest bumper formed and plated at the plant is an 88-inch unit for one model of Chevrolet truck, smallest is an 18-inch rear section for a Chevy station wagon.

Fig. 2—One of the Meaker electroplating lines. Each line is 535 feet long, has tanks 17 feet wide and nine feet deep. The lines occupy a major section of the two-story plant's second floor. There are three plating lines like this one, and each has 43 tanks. Each carrier can hold 40 bumper sections.

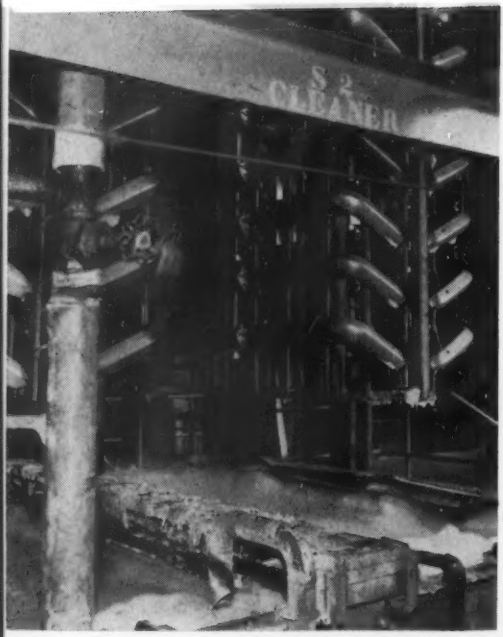
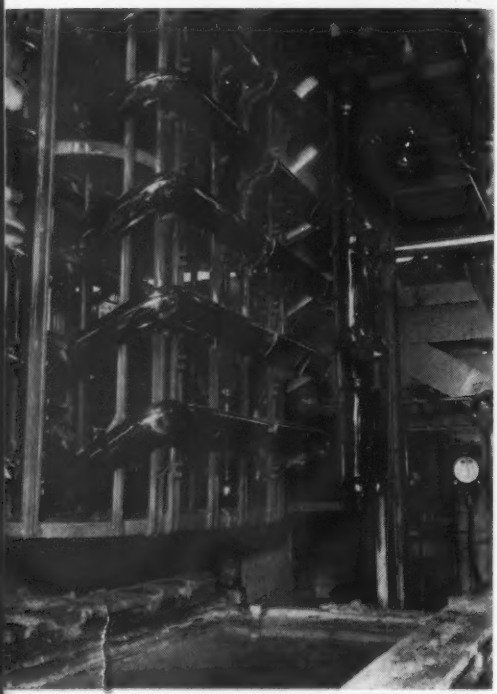


Fig. 3—Bumper parts emerge from soak cleaning bath, first of 43 vats included in each of three Meaker "Straight-A-Way" completely automatic metal-finishing systems.



Housing the automatic plating machines is a two-story building that sprawls over 14 acres of the Michigan countryside. Each of the Meaker cell-type machines is 535 feet long, and each has 43 tanks. Each carrier can hold as many as 40 bumper pieces, ranging in size from an 88-inch truck section to an 18-inch section for station wagons.

The trip through the cycle of cleaning, rinsing, etching, nickel and chromium plating takes one hour and 42 minutes.

A giant steel framework above each line is the heart of the Meaker unit. It powers and guides the carriers which automatically lift, lower and move tons of bumpers and springs from one processing tank to another. Nearly 100 motors are required in the three lines for moving carriers from vat to vat. Unplated bumpers are loaded at one end and are removed dry and fully plated at the line's other end.

The control offered by the automatic plating process results in excellent product uniformity and an extremely low reject rate—less than one per cent.

The installation can process parts of virtually any size or shape.

The cell-type electroplater's 17-foot wide, nine-foot deep vats are raised about knee high above floor level, improving worker safety.

By being able to bypass individual sections, each line is kept in virtually continuous operation, minimizing the possibilities of costly manpower or production losses due to shutdown.

Fig. 4—Nickel and chrome plated bumpers near completion of plating process. The entire operation takes about an hour and 42 minutes. (Photos courtesy Meaker Co., Subsidiary of Sel-Rex Corporation, Nutley, N. J.)

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What To Look for When Considering a Steam Source

Tips on calculating size and number of units needed . . . installation, maintenance . . .

By **WALTER F. MALSBARY**
Vice-President
Malsbary Manufacturing Co.
Oakland, California

How am I going to heat my cleaning, plating and phosphatizing tanks and vapor degreasers? If you're enlarging your present facilities, modernizing, replacing an old boiler, or planning a new finishing setup, you face this question.

If you decide to use steam, then you must determine the type and size of steam source required. Your choice can have a decided effect on your costs. Before deciding, ask yourself these questions:

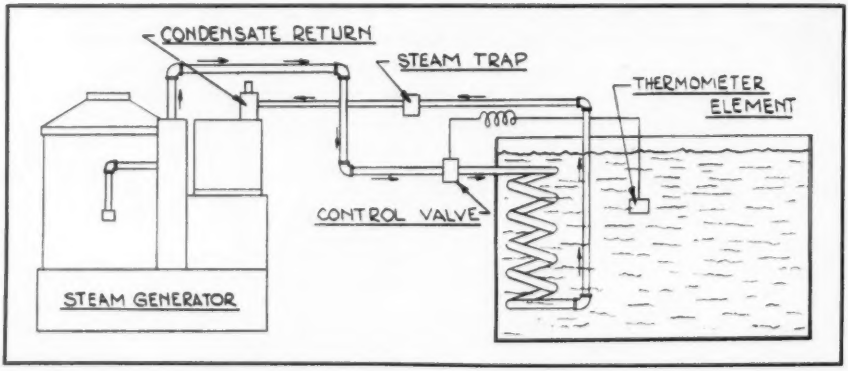

Fig. 1—Sketch showing typical installation of steam generators and tank heating coils. Control valve shown can be any self-operating or motor-operated valve. Coil may be positioned anywhere in the tank—bottom, side or end. It should be located for proper drainage of condensate, however. Small units such as this can be installed close to tank.

1. How much steam (or heat) do I need?
   (a) For what purposes?
   (b) Should I get one big unit, or two or more smaller units?
   (c) If I outgrow my present needs, can I easily add to the steam source, or will a complete replacement be necessary?
2. What type of steam source best fits my needs?
   (a) Which requires least heat-up time?
   (b) How do fuel requirements compare?
   (c) What about safety?
   (d) What are the code requirements?
   (e) What is easier to install?
   (f) Which can be installed closest to point of use?
   (g) What are the maintenance problems of the different types?
   (h) How do the various steam sources compare in price?

The following discussion should help you to answer these questions.

How to Determine Steam Needs

Basically you need steam for three purposes:

1. To get tanks up to required temperature for operating.
2. To make up for heat lost by radiation.
3. To replace heat taken out by parts being processed.

The quickest and easiest way to determine B.t.u. requirements for doing all three is to call in your own engineer or a consulting engineer. However, here's an easy formula for calculating the heat required for points 1 and 3 above.

Weight in pounds of material to be heated x Specific heat of material x Temperature rise required = B.t.u. needed.

Figuring heat lost by radiation (point 2 above) is considerably more involved, but you can figure roughly 15 per cent loss per hour—unless there are unusual conditions, such as outdoor tanks, strong air currents, unusually low atmospheric temperatures, and so on.

The following example shows typical calculations made to determine heat requirements, using the formula just described. Assume that you have to heat a solution with a specific heat of 1 in a tank 4 by 8 by 3 feet, raising the temperature from 60 to 180 deg. F., and you plan to run 200 pounds of steel through the solution hourly.

Tank volume: 4 x 8 x 3-foot = 96 cu. ft.

Solution weight: 96 cu. ft. x 62.4 lb. (weight of solution per cu. ft.) = 5990 lb.

Heat required: 5990 lb. x 1 (specific heat of plating solution) x 120 deg. (180 deg. - 60 deg.) = 718,800 B.t.u.

Plus 15 per cent reserve for radiation heat loss per hour from uninsulated tank = 107,820 B.t.u. (Insulation will eliminate almost all heat loss from tank walls.)

Total heat required to heat tank to desired temp.: 826,620 B.t.u.

Once tanks are heated to operating temperature, very little heat is removed by incoming parts. For example:

200 lb. steel hourly x 0.11 (specific heat of steel) x 120 (180 deg. - 60 deg.) = 2,640 B.t.u.

(continued)

"In effect, multiple units give you built-in standby service."

Table I lists specific heats and specific gravities of a number of materials.

Now how much boiler horsepower (b.h.p.) do you need for this operation? The determining factor is tank-heating time. As this sample problem shows, it takes 826,620 B.t.u. to raise solution temperature 120 deg. F., but only 2,640 B.t.u. to process 200 lb. of steel per hour. So it's obvious that heat input required to maintain desired solution temperature is only a fraction of that needed to heat the cold solution.

Table I

MATERIAL	SPECIFIC HEAT	SPECIFIC GRAVITY
Water	1.00	1.00
Steel	0.11	7.80
Concrete	0.27	2.00
Earth	0.20	1.00
Wood	0.45 - 0.65	0.35 - 0.90
Lead	0.031	11.34
Aluminum	0.23	2.64
Wax	0.69	0.87 - 0.91
Copper	0.092	8.92
Rubber, vulcanized	0.445	1.10
Acid, sulfuric (5%)	0.95	1.03
Acid, nitric (10%)	0.90	1.05
Trichlorethylene	0.225	1.471
Perchlorethylene	0.205	1.62

Here's the b.h.p. requirement (33,475 B.t.u. = 1 b.h.p.) for different tank-heating times:

1-hour tank heat-up time, 25 b.h.p.
2-hour tank heat-up time, 13 b.h.p.
3-hour tank heat-up time, 9 b.h.p.
4-hour tank heat-up time, 7 b.h.p.

Heat-up time as used here is tank heating time; it does not include the time required to produce steam in your steam source. You can reduce tank heat-up time by insulating the various tanks and by covering them at night. This reduces heat loss and, consequently, reduces the temperature rise required to heat the solution to operating temperature.

How Many Steam Units?

Assuming you've determined how much steam you need, shall you buy one large steam unit or two or more smaller ones?

Two or more units naturally give you more flexibility. Usually they can be placed nearer the point of use, thus reducing the length of pipelines. If you're not going to use a portion of your operation for a day or two, there is no need to fire up the smaller unit serving it, and thus you save fuel. Furthermore, having two or more units means you'll not be shut down completely if one steam unit develops troubles. In effect, multiple units give you built-in standby service. Smaller units enable you to add units, without heavy capital outlay, as your plant grows—and you can add without shutting down your plant.

However, if you want to heat everything from one source, or you decide on a steam source that re-

quires an insulated room, then a single large unit will be preferable—but enlarging will be difficult.

What Type of Steam Source?

Roughly, steam sources are of two types: reservoir boilers, which usually require up to a half-hour and frequently more to produce steam; and flash steam generators (continuous-coil type), which form steam from a cold start in 2 to 3 minutes. Both types are available in models as low as 5 b.h.p., but the flash steam generators seldom are larger than 160 b.h.p., with the most popular models in sizes of 30 to 50 b.h.p. and lower.

If you operate around the clock, week after week, with a fairly constant plating load, then the reservoir boiler may be best for your plant.

If you operate only one or two shifts daily, and your plating load fluctuates, then the flash steam generator's ability to produce live steam in just 2 or 3 minutes can be very important. Tank heating time is reduced, fuel cost is reduced, and useful operating time is increased.

What About Installation?

Today both reservoir boilers and flash generators are available in packaged models, so installation isn't too difficult. Many, especially in the smaller sizes, don't even require special foundations when installed on a concrete floor. Often installation is chiefly a matter of hooking up to electricity, water, fuel, and steam mains. However, local codes vary, so check before you install—or, for that matter, before you decide on a type of steam source.

Flash generators require little room and weigh little. They usually can be installed right next to where

(continued)

Fig. 2—Steam for automatic barrel plating operation at Pacific Rustproofing is provided by 15-b.h.p. steam generator. Such compact units can be installed near plating tank.

". . . we recommend installation of a closed system—one in which the steam condensate is returned for re-use."

the steam is to be used. And they're as safe as a home hot water heater.

Maintenance Requirements

No matter how good the steam unit you buy, it will require maintenance—and occasional repair. Make sure an adequate instruction manual, containing maintenance and trouble-shooting suggestions, is available—then follow the instructions. You'll save yourself a lot of grief.

Flash steam generators are so simple—about like a steam cleaner—that most repairs can be made by a plating shop's own maintenance men. Even a coil change can be made in a matter of hours (many users report changing coils in 1 to 2 hours time). Retubing a boiler, the equivalent of changing a flash generator coil, normally requires complete shut-down for a day to a week.

If you burn oil, you may find frequent de-sooting necessary; usually gas burns clean enough so that soot will be no problem.

Some Trouble-Saving Ideas

Regardless of which type steam source you select, we recommend installation of a closed system—one in which the steam condensate is returned for re-use. A closed system has two important advantages: (1) It saves heat by re-using warm condensate instead of new water; (2) It greatly reduces scale. Even relatively soft water will form scale in boilers and flash coils; most engineers figure that ⅛ inch of scale cuts fuel efficiency 20 per cent—and as little as 1/16 inch increases fuel cost 12½ per cent. That's worth saving.

There are times when a closed system may *not* be desirable. If the solution in the processing tank is corrosive, it may cause a leak in the heating coil and corrosive solution will enter the coil that returns to the boiler. This can cause serious damage to the boiler or generator coils. Other processing solutions, not particularly corrosive in themselves, may enter the heating coil through a faulty joint or fitting and be returned to the boiler where they can cause damage to the boiler coils. Many finishing engineers prefer that condensate from certain processing solutions (nickel and chromium plating solutions, for example) run into hot-water rinse tanks, and not return to the boiler. Whether condensate lines from heating coils in alkaline cleaners, acid tanks, cyanide plating solutions, or phosphatizing tanks shall run back to the boiler or run into hot rinse tanks may depend on local safety regulations, local opinion, or other factors.

If you're not installing a closed system, by all means install a water softener to treat all water you use—or in boilers use water treatment compounds. Cost is small and it will save maintenance work and fuel.

Remember, too, that exterior scale on heat-transfer pipes in your solution tanks reduces heating efficiency—and thereby requires more time for solution to reach required temperature. In fact, scale can get thick enough to prevent transfer of heat from steam pipes to tank. A regular program to keep heat-transfer pipes free of scale and other sludge will

(continued on page 70)

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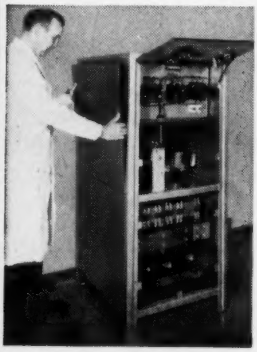

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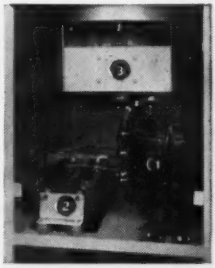

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more than pay its way in heat-up time and help you hold planned production schedules.

Checkup Before Buying

Right here's a good place to back up and ask yourself, "Do I really need more steam capacity?" Can the efficiency of our present system be improved? Take a look at:

1. *Steam mains*—If they're uninsulated you're probably dissipating more heat into space than you're transferring to solution tanks.
2. *Steam traps*—Clogged, blocked open traps can waste heat by diverting steam to drain or to atmosphere through the hot well. Touch the pipe on each side of the trap to determine if trap is working properly. Pipe on "steam side" should be hotter than pipe on other side.
3. *Fans and ventilators*—Directing air currents away from tanks and steam mains can radically reduce heat losses.
4. *Tank insulation,* especially where high temperatures are required. Just about the only heat loss from an insulated tank is from the open top. Cover tanks at night or when out of use. Less heat is needed when you resume operations.
5. *Scale*—As explained above, scale in coils or boiler or on and in heat transfer pipes robs you of both fuel and heat.

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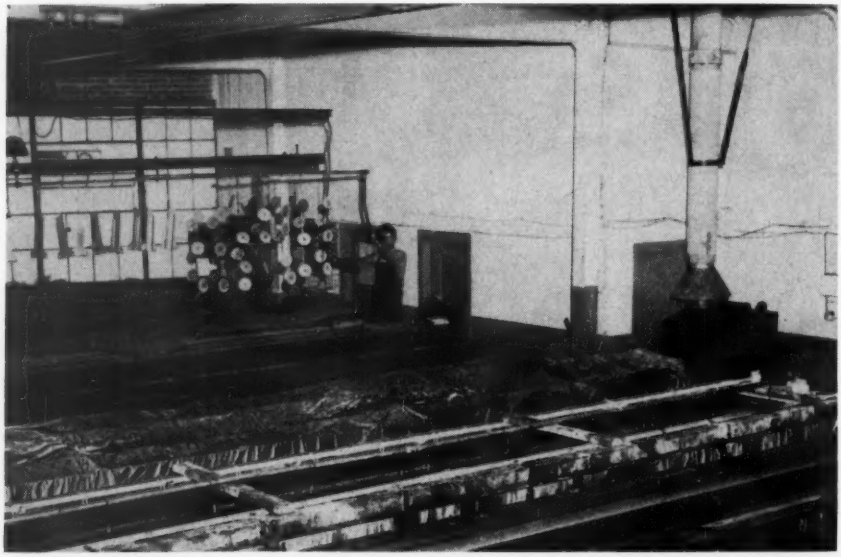

Fig. 3—In this installation, a 10-year-old, 15-b.h.p. flash-steam generator heats two alkaline tanks—one of 1000 gallons capacity and one of 1900 gallons—and a vapor degreaser. This is a closed system, with condensate returning to the steam generator. Note how large tanks are covered to reduce heat loss from radiation and air movement. (Illustrations courtesy Malsbary Manufacturing Company, Oakland, California.)

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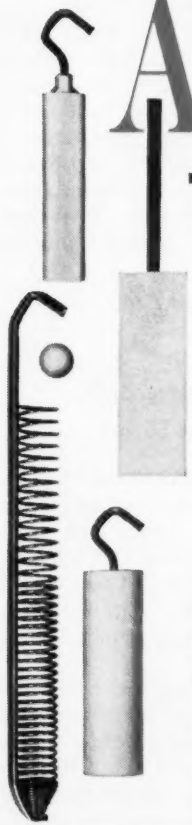

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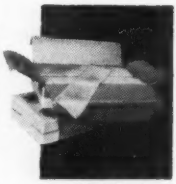

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6. *All controls* should be inspected to see that they're coming on and shutting off at the proper temperature settings.

If your checkup indicates you still need a steam source and you've studied the different types, you'll naturally compare prices. When you do so be sure you're comparing delivered, installed prices for similar B.t.u. output. Steam units vary greatly in weight, so even freight can be a considerable item. Installation requirements—and naturally costs—also vary. If you're planning a closed system, make sure all prices being compared include condensate return. In short, the prices you compare should include every item needed to make your system ready for operation.

★ ★ ★

An Efficient Painting System in 6000 Square Feet

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If any or a combination of these problems are yours, you may profit from a look at a new automatic paint finishing system for portable typewriter parts. It was installed recently in Royal McBee's new Springfield, Mo., plant.

The Royal Typewriter painting operation is notable from two standpoints.

(continued)

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- Supervision of new process installations and training of operating personnel.
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- Immediate emergency field service.
- Fully staffed Customer Service Laboratory complete with pilot processing facilities to duplicate actual production.
- Prompt, dependable delivery of production chemicals.

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First, its whole, winding, 1160-foot length is confined in a space only 60 by 100 feet. The space is not crowded and it includes all the necessary equipment required—among which are some sizeable units—24-foot prime bake and 49-foot finish bake ovens, and 20 and 30-foot electrostatic painting stations.

Second, a "reverse piggy-back" or add-on handling method that enables batch-painted parts to be fed into the conveyorized finish baking line.

Reference to the accompanying layout sketch provides a good deal of the story. It shows how the conveyors were arranged to carry the work at several elevations to accommodate all essential equipment.

The system was designed, manufactured and erected to Royal McBee requirements by the Industrial Equipment Division of The R. C. Mahon Co., Detroit.

Conveyor speed is variable—4 to 12 feet per minute. Loads of 20 pounds per hook are permissable. Time required to produce a fully painted and baked part is about 160 minutes.

Typewriter parts trucked to the load station of the finishing system, hang on the hooks suspended from a 3-inch monorail conveyor, about 24 inches apart.

In the painting sequence, they travel through a 5-stage phosphatizing machine, dryoff oven, prime electrostatic booth, touch-up spray, 4-minute accelerated prime oven (heated to about 150 deg. F.) double-finish electrostatic unit, water-wash touch-up booth, then via tunnel to

(continued)

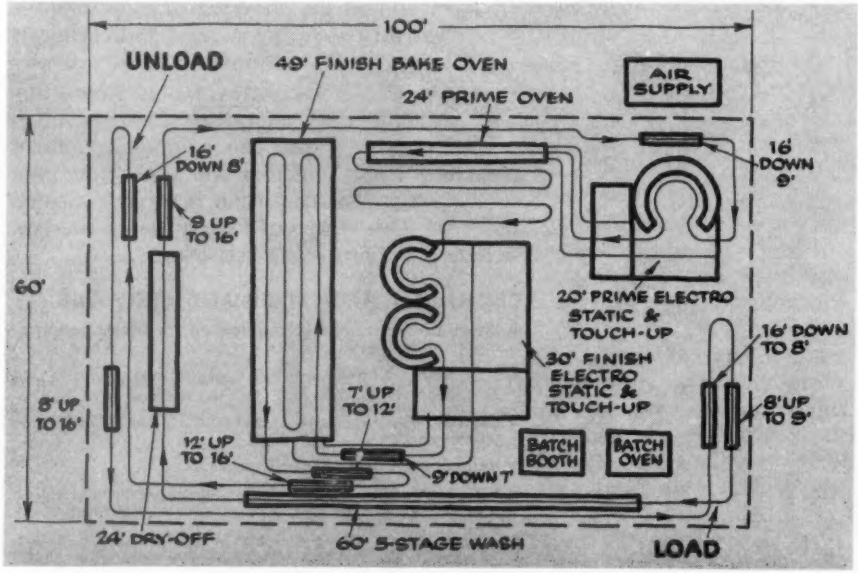
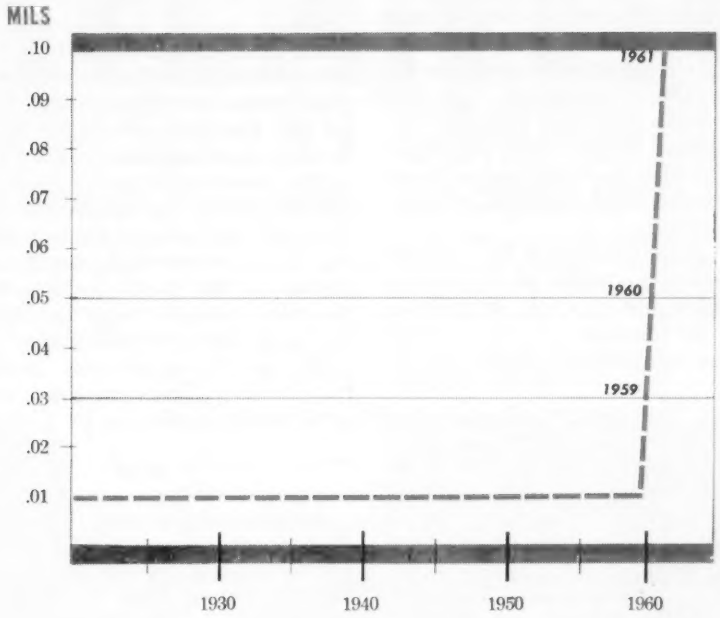


Fig. 1—Sketch shows layout of system recently installed in Royal-McBee plant. Area is 60 by 100 feet, is not crowded. Room has been left for future additions to the finishing system.

For increased corrosion resistance follow the trend to thicker decorative chromium plating...



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Yes, the trend is to thicker chromium plating to produce increased resistance to outdoor exposure economically. Today's reports indicate that the thicker chromium plating shown in the simplified graph above makes possible a marked increase in the desired corrosion resistance *without* a proportionately high increase in plating costs. And the sales appeal of your product *goes way up!*

Whichever plating process you may select to produce thicker chromium plating, specify Mutual Chromic Acid. It's always 99.75% pure—or better. Sulfate content never exceeds 0.1%. Rigid quality control by Mutual insures that the chromic acid you get is always the same. This makes it easier for you to control accurately the acid-sulfate ratio of your plating bath.

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the large finish-baking oven.

One operator controls the whole operation, including conveyor starter motors, temperature recorders, and so on, from a central control panel.

Both electrostatic stations in the system—the single-prime unit and double-finish unit—are designed with pit-mounted reciprocators. Both are provided with clean, filtered air in an arrangement which, in effect, pressurizes the booths.

The finish-bake oven is a 2-zone installation, normally set to provide a complete baking cycle in approximately 50 minutes.

Other equipment installed in the small space: a batch spray booth and batch oven; and a stripper line consisting of two stripper tanks, two rinse tanks, a rust-preventive dip tank with exhaust facilities, and overhead electric hoist on a monorail.

Fig. 2 shows how Mahon and Royal McBee engineers arranged the system so that odd-shaped parts, or those painted a different color can be fed into the main system for the trip through the automatic baking oven.

The transfer is made through a special door in the tunnel leading to the oven, just outside the exit end of the finish electrostatic booth. Also shown is the device which made possible "reverse piggy-backing"—the suspending of odd-shaped parts under the "Christmas tree" hooks of the main line. The square rack devised is easily suspended by a worker.

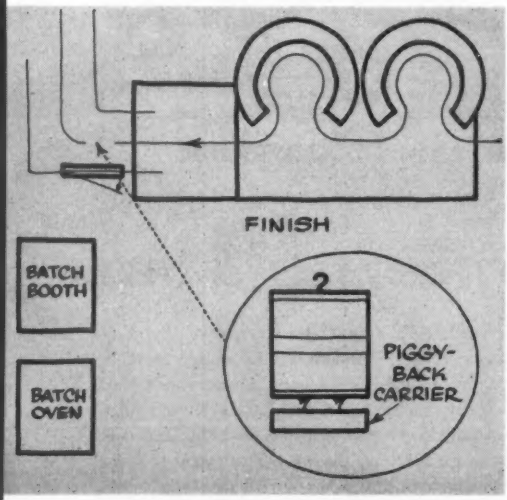

Fig. 2—Inset (circled) shows the "add-on" or "reverse-piggy-back" arrangement for feeding odd-sized painted parts into the main baking oven. Such parts are painted in batches, hooked on conveyor just as it emerges from electrostatic spray booth, in tunnel that leads to baking oven. (Illustrations courtesy R. C. Mahon Company, Detroit, Michigan.)

★ ★ ★

Mechanical Polishing. By Walter Burhart, H. Silman and C. R. Draper. Published by Robert Draper, Ltd., 85 Udney Park Rd., Teddington, Middlesex, England. 267 pages. Price, $9.25.

This book presents a detailed description of polishing, buffing, barrel finishing and abrasive blasting.

The greater part of the text is concerned with metals. Subjects include measurement of surface finish; abrasives, dust control; mops, brushes, belts, surface speed, metal removal; polishing machines, composition applicators, fire hazards, product-design problems, costing; media, preventing staining, use of grease, scratch brushing, satin finishing, lapping, honing, super-finishing, grit blasting; and specific procedures for polishing various metals.

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Improve Your Phosphate Coatings

Panel discusses common difficulties in phosphatizing, describes ways to improve results . . .

The following representatives from Turco Products, Inc., Wilmington, Calif., participated in this discussion:

Dr. David L. Cramer, manager, Research Div., Research and Development Dept.

Hal Frost, chief process engineer, Marketing Div.

George Pimbley, research chemist, Metal Surface Chemical Coatings

Archie K. Beard, general sales manager

Robert Jackson, manager of Turco Metalworking Division, wrote introduction.

Conferees are (clockwise, beginning in left foreground) Dr. David L. Cramer, Hal Frost, George Pimbley, Ezra A. Blount, C. F. Devine, Archie K. Beard. (Photograph by PRODUCTS FINISHING.)

Exclusive PF Conference

Introduction

Phosphate coating is probably one of the most misunderstood and misused processes in the finishing business. Unfortunately, industry in general, with the possible exception of some of the large, carefully controlled industrial plants, has limited knowledge of what's occurring when phosphatizing is done; thus many users are getting results far below optimum. A discussion of some of the variables involved may be of some assistance in improving results.

Equipment

Obviously, the equipment for phosphatizing—the spray washer or immersion tanks—must be large enough to accomodate the size and number of parts to be processed in a given time.

Spray nozzles are important. Correct design, number, and placement of nozzles ensures thorough coverage of all areas of every part. Nozzles should be kept clean if good results are to continue.

Pumps should be adequate to provide thorough wetting and flushing. While sufficient pressure is often helpful in removing solid soils not easily removed by chemical action, too much pressure is undesirable; in some cases excessive pressure results in spotting and uneven coating.

Pump maintenance, including lubrication and proper packing, is also a "must." Loose packing has been known to cause excessive aeration and subsequent foaming of chemical cleaning solutions.

Phosphatizing Solutions

Phosphatizing solutions in common use today can be divided into two main categories: iron and heavy metal (including zinc and/or manganese phosphates).

Iron phosphates are usually applied in a three-stage system. The first step incorporates cleaning as well as phosphatizing, while the second is a rinse and the third a chromic-acid inhibitive rinse.

Zinc phosphates normally are applied in five or six-stage washers or still dip tanks, the spray washer application being predominant. In these systems, the first stage is cleaning only, the second a rinse, the third phosphatizing only, the fourth another rinse, and the fifth a dilute chromic-acid inhibitive rinse. Six-stage systems incorporate an additional rinse.

Zinc phosphate systems produce better corrosion resistance and adhesion than iron phosphate, but iron phosphates do a satisfactory job in many, many cases.

Where hard water is encountered, selection of the proper cleaner or phosphate-cleaner combination is most important. If the cleaner cannot cope with the soils and water hardness, sludging, streaking, and powdery phosphate coatings result. Deionized water is required for top performance in some areas.

Racking

Hanging of parts on conveyor racks is important. Be sure solutions

(continued)

"We often find that a phosphate coating won't form on a very sharp angle."

drain from recesses and that all surfaces are thoroughly wetted.

Control

To get consistent results from a properly engineered phosphatizing installation, concentration, temperature, spray pressure and pH must be kept within the limits set by the supplier of the phosphatizing material.

Proper maintenance of rinses is also mandatory. Overflowing ambient-temperature rinses of clear water usually are satisfactory. Users often try to "cut corners" on rinsing, but experience shows that development of inadequate coatings often can be traced to poor rinsing.

Keeping these general introductory recommendations in mind, the editors of PRODUCTS FINISHING asked Turco's technical representatives the following specific questions which, it is hoped, will guide the user of phosphate coatings in improving his finishes and in avoiding troubles encountered in phosphatizing:

What metallurgical characteristics of the basis metal affect the formation of phosphate coatings?

Principally, three things related to metallurgy affect phosphatizing: first the composition of the metal; second, contamination during mill finishing; and third, changes in structure—physical changes that occur in stamping, bending, drawing and other forming processes. Unfortunately, there usually isn't too much that finishers can do about these, other than to compensate for them. We have to take the metal as we find it. Sometimes if it's too bad, we can reject the steel or the formed parts, but ordinarily we have to cope with it and do whatever we must to get a satisfactory phosphate coating.

We often find that a phosphate coating won't form as well on a very sharp angle. On the side that is stretched—the outside—the coating might actually form better, but on the inside, where the metal's compressed, you may have a work-hardened area that doesn't take the coating. It's a little hard to tell the difference by visual inspection. But there will be differences caused by work hardening. Sometimes it's necessary to sandblast such an area to achieve satisfactory phosphate coatings.

Nitriding or case hardening creates an extremely difficult surface for phosphatizing. Such a surface usually requires polishing or cleaning with special materials to promote formation of a smooth coating.

Inconsistency of successive lots or types of steel coming through on a production line is apparently so common that experts in phosphatizing do not stress its importance. Everybody just accepts the fact that there is variation. But it is definitely a major problem.

Finishers should insist on a little more specific certification regarding steel supplies. In this way, when the user of the steel receives a certificate indicating a bad condition, he can adjust his process accordingly.

If quality-control charts are set up adjacent to the phosphatizing line, they help to anticipate trouble and the operator can make adjustments before a lot of material gets rejected.

Just how does a phosphate coating increase corrosion resistance and improve adhesion?

Corrosion resistance is improved by the blanket of electrically resistant crystals formed on the surface of the metal. The phosphate coating is nonconducting to electrical currents. Since rusting (corrosion) is an electrochemical action, an electrically insulating blanket of crystals on the metal surface blocks current flow and thus prevents corrosion. This thin "blanket" is particularly important in the presence of water. If the paint is gouged, rusting will begin where the gouge exists, but it will be confined to the gouged area. The same is true of sharp edges. The paint may give way at these spots and leave the surface exposed but if there is a blanket of phosphate crystals, it retards spread of corrosion.

The other function of phosphate coatings is bonding the paint to the metal. The bond here is both chemical and mechanical.

It should be clearly understood that phosphate coatings are not an end in themselves. They are preliminary treatments that are invariably followed by other treatments such as painting for corrosion protection, oiling for rust protection or lubricating for drawing.

Is use of deionized water beneficial enough in making up phosphate-coating solutions to justify the expense of installing a deionizer?

In most cases, deionized water is not required. When your water supply has an extremely high chloride content, it will be worthwhile and wise to use a deionizer. If a zeolite softener is used, care must be exercised when backflushing with sodium chloride, to see that the deionizer is thoroughly flushed before it is put back into use.

There are some cases where concerns cannot afford *doing without* deionized water. I am thinking of one concern in Texas where we found over 1,000 parts per million of hardness and 837 parts per million of chloride in the tap water. At the time, this company was producing about 90 per cent rejects. A deionizing system eliminated the rejects and amortized itself in three months.

A deionizer is certainly feasible for supplying water used in the final inhibitive rinse. Every good phosphatizing installation includes a chemical inhibitive rinse, and it's quite important to have this made up with the purest possible water.

How do you know when to "dump" a phosphate solution?

Properly maintained zinc and manganese phosphate solutions can be used indefinitely. I've heard of phosphate baths that have not been dumped in two to four years. Careful maintenance at all times, regularly removing sludge, is necessary to do this, however.

Iron phosphate baths have limited life expectancy. There comes a time when you can't do anything more with the iron phosphate bath except dump it. This depends on the quantity of the work going through and the soils being removed. The best thing you can do when the bath won't respond to adjustments and won't do good work is just to dump it, clean out the tank, and start over.

How do you determine when the bath is no longer effective?

(continued on page 85)

TROUBLE SHOOTING TABLE

(These conditions are apropos mostly of heavy-metal, zinc or manganese phosphatizing)

Causes of Difficulties	Results	Remedies
Metallurgical conditions — work hardening from forming, inherent defects in the metal, etc.	Little or no coating; coating is not continuous; poor adhesion; coarse, sparkling or blotchy coatings; variations of color in the phosphate coating; mottling.	Do anything that will speed or improve the action of the phosphatizing bath. If condition is severe, pickling or sandblasting may be necessary.
Temperature of bath too low.	Little or no coating; non-adherent coatings; rough coatings; excessive powder.	Raise temperature to that specified by the manufacturer of the phosphate coating.
Temperature of bath too high.	Rough coatings; powder on surface of work.	Lower temperature to prescribed limits.
Too little time for immersion or spray.	Little or no coating formed; non-adherent coating; blotchy coatings.	Increase immersion or spray time.
Poor cleaning.	Little or no coating; non-adherent coatings; coatings are not continuous; loose and white powdery coatings; lack of adhesion; coarse, blotchy or sparkling coatings; black or gray smut on coating.	Improve cleaning so that pieces show no water break in cold-water test.
Concentration of bath too low.	Little or no coating.	Increase concentration to level recommended.
Too much free acid in bath.	Coarse, rough, sparkling coatings; no coating at all; thin coatings; less corrosion resistance; flash rusting.	Titrate to check concentration and acid balance relations; allow bath to stand unheated overnight; introduce clean scrap iron or steel wool; add small amounts of caustic soda; reduce temperature.
Too little free acid in bath.	Thick, non-adherent coatings; powdery coatings.	Titrate to check concentration and acid balance relations; add fresh concentrated phosphatizing material; increase temperature; add small amounts of phosphoric acid. Raise temperature; remove ferrous iron.
Insufficient break-in—lack of ferrous iron phosphate in bath.	Little or no coating; non-adherent coatings.	Add six ounces ferrous phosphate powder per 100 gallons of bath or introduce iron powder, steel wool or clean scrap iron. About 0.15 per cent ferrous iron on the weight of the bath is optimum for zinc phosphate coatings under paint; more, up to 0.4 per cent, is advantageous in the production of thicker coatings,

Excessive ferrous iron phosphate in bath.	Rough coatings; blue or green blotches; scanty coatings; excessive powder on coatings; yellow coatings; reduced corrosion resistance.	Test for ferrous iron, then add small amounts of accelerator or other strong oxidizer such as hydrogen peroxide. Wait until curds have disappeared before using bath.
Poor pickling or interfering pickling inhibitor.	Little or no coating formed; rough, blotchy or sparkling coatings.	Change pickling chemicals and/or inhibitor; improve rinsing procedures; use activating chemical dip after pickling; do not allow parts to remain in pickle too long; avoid excessively high temperatures; rinse thoroughly.
Defective spray nozzles in washing machines, poor spray patterns.	Bare spots in phosphate coating.	Clean and adjust nozzles.
Poor racking.	Bare spots in phosphate coating.	Change positioning of parts on racks.
Seepage of grease from joints in parts.	Bare spots in phosphate coating near joints.	Improve cleaning or rearrange work on racks.
Dissimilar metal joints.	No coating in area where metals are joined. One metal takes the coating preferentially.	Acid treatment or pickling; improve phosphate coating practices.
Sludge contamination or excessive amounts of sludge in tank.	Excessive powder on coating.	Remove sludge; eliminate conditions that are causing excessive sludge; or causing sludge to be excessively agitated.
Dry-off too slow.	Yellow color of fresh rust.	Improve phosphate coating quality; use inhibitive rinse after phosphatizing; dry parts as quickly as possible with heat; blow moisture from crevices.
Chromic acid inhibitive rinse too concentrated.	Yellow coatings that resemble flash rust.	Decrease concentration of inhibitive rinse, but maintain concentration recommended by manufacturer of inhibitive rinse. If concentration of inhibitive rinse is too low, corrosion resistance will decrease.
Use of steel stock with heat scale.	Phosphate coating has brown, red or copper-like tinge.	Remove heat scale by pickling or surface abrasion before phosphatizing.
Poor rinsing after phosphatizing.	Powder on surface of coating.	Rinse water should be clean and cool; hot rinse may "set" unreacted phosphate.
Excessive sludge.	Powder on surface of coating caused by sludge deposition on work.	Remove sludge frequently.

TROUBLE SHOOTING FOR IRON PHOSPHATIZING

(These conditions are specific for iron phosphates)

Causes of Difficulties	Results	Remedies
Excessive spray pressure or agitation.	Foaming.	Spray pressure should be 20-30 p.s.i.; agitation should be reduced when foaming is a problem.
Temperature too low.	Foaming, poor cleaning.	Raise temperature.
Contaminants in bath such as soap-type lubricants, drawing compounds.	Foaming.	Correct cause or add foam suppressor, kerosene or light oil.
pH too high.	Insufficient coating formed.	When maximum phosphate coating action is desired, keep pH at 3.0-4.5 range, never over 5.0. (Good cleaning may be performed at somewhat higher pH.)
Excessive contamination in bath. Solution "worn out."	Poor coating formed. Bath "disintegrates" or separates into layers.	Dump and make up new solution.
Long delays between stages.	Blotches and spotty areas, rust.	Eliminate excessive delays.
Delays in drying work.	Flash rust.	Force dry with heat. Use bath containing flash-rust inhibitor.
Insufficient time allowed in phosphate solution or spray.	Poor cleaning; inferior coating.	Slow conveyor; allow more time.
Concentration too low.	Poor cleaning; insufficient coating.	Raise concentration or dump.

Visual inspection of the work. Blotchy coatings, powdery coatings, coatings that show smut rub-off on tissue, visible white powder, failure to pass salt-spray or water-immersion tests. If it's impossible to adjust the bath by applying remedial measures, you dump.

What conditions increase sludge formation?

Speaking first of the iron phosphates, those with the lowest pH or having the most phosphoric acid will produce more sludge because they act more vigorously. The iron phosphates which contain pyrophosphate are freer of sludge. As a class, the iron phosphates are relatively free of sludge.

Using zinc and manganese phosphates, higher pH produces more sludge. Using the "heavy-metal" phosphates, you have to divide sludge into two types: heat sludge and work sludge.

Heat sludge can occur even if you just heat a normal zinc phosphate bath with no metal in it in a glass beaker to 160 deg. F. or a little higher. As you go up in temperature, the sludge accumulates rapidly. Normal manganese phosphate baths do not readily form sludge by action of heat alone, at temperatures under the boiling point. The solubility of normal heavy-metal phosphate compounds in water becomes less as the temperature is raised; sufficient additions of acids can, of course, maintain solubility.

Work sludge is the result of decomposition that occurs as the phosphate bath reacts with the metal. Generally speaking, the higher the temperature and the higher the pH, the more sludge you'll have. Manganese phosphates have a tendency to form more work sludge than do zinc phosphates, being opposite in this respect to the heat sludge tendency noted above.

Sludge is a normal result of heavy-metal phosphatizing, and we must conclude that if the bath is not sludging, it may not be phosphatizing.

What methods are used for removing sludge?

Centrifuges have been used, as well as methods where the sludge is allowed to settle and the clear supernatant liquid is returned to the operating tank. Continuous filtration also is sometimes used to remove sludge. Actually, any method of removing solid matter is adequate.

What instruments and controls are necessary in phosphatizing?

The production of consistently good phosphate coatings requires some chemical analysis. To determine amount of "free" acid and amount of "total" acid in a bath, titration is necessary.

A control device is necessary to maintain proper temperature.

A water-level control is also useful, so that fresh water is added automatically. Large installations should have proportioning pumps to feed the chemicals. It might be well to include a good pH meter in the line.

How does a chromic rinse improve a phosphate coating?

All zinc and manganese coatings, even the best, have open pores. The final inhibitive rinse deposits an inhibitive chemical in these pores and prolongs life in salt-spray tests, water-immersion tests and in actual out-

(continued)

"Recent research has shown that chromic acid rinses should be more concentrated . . ."

door exposure. It has been shown, for instance, that by using an inhibitive rinse, other conditions being equal, you can prolong salt-spray life by as much as 50 per cent.

What concentration of chromic acid is optimum in the inhibitive rinse?

Recent research has shown that chromic acid rinses should be more concentrated than was formerly thought advisable. The recommended rate used to be 8 oz./100 gal. of bath. Researchers have found that corrosion resistance improves when concentration is as high as 2 lb./100 gal. of bath—either chromic acid or chromate-type mixtures.

There is a limiting factor, however. Staining that results from a rinse this concentrated may be visible under light-colored paints. But the concentration shouldn't be less than ½ lb./100 gal. in any case. After the chromate treatment, or chromic-acid rinse, the effect is permanent and you can't wash it out. We consider some such rinse practically indispensable for good work.

The exception would be when you are applying a phosphate coating for metal-forming or drawing operations. Here chromate treatments are not necessary at all because the phosphate coating is later removed.

Some researchers are quite firm in their conviction that the zinc phosphate coating is superior to iron phosphate in corrosion inhibition and adhesion promotion. Do you agree?

I would agree on the superiority of zinc phosphate in corrosion prevention and I would agree to an extent on paint adhesion. I do think, however, that we have to temper our judgment and take into consideration what the finisher needs.

A concern making trim for automotive windows, for example, had to cut costs. To do this they specified that the phosphate coating be not heavier than 25 mg./sq. ft. Consequently, this was a case where you wouldn't use a zinc phosphate. The requirements of the specific application are important in deciding between zinc and iron phosphates.

There are many cases where the finisher doesn't require the corrosion resistance possible with a zinc phosphate coating. He desires only to improve paint adhesion and to increase corrosion resistance moderately.

What should a finisher consider in specifying coating weights?

There is a tendency to worship a certain coating weight—if the coating weight is 155 mg./sq. ft., it's a good product and if it's 145, it's a poor product. That's not true. A coating should be judged on the basis of what it will do; its smoothness, tightness and corrosion resistance.

Coating weight is not even a measure of thickness. Actually this is a measure of the weight of phosphate coating that can be stripped off; it really should be called the "stripping weight." This figure tells you nothing

(continued on page 90)

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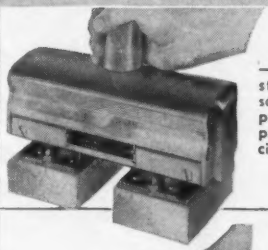
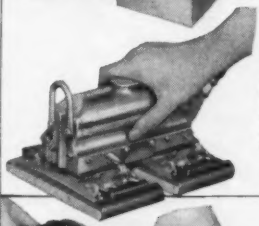
Model OS-800
— lighest weight orbital air sander on the market, at only 3 lb., packs the power and speed needed for production jobs.

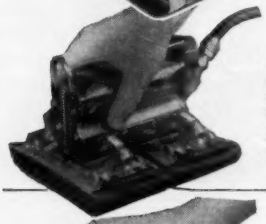


Model 600
— heavy-duty, straight-line air sander for sanding, pumice rubbing, or polishing, 1100 oscillations per minute.

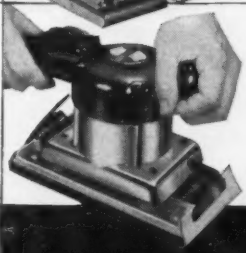
Model OS-700
— single-pad orbital air sander, weighing 5 lb., operates over 6000 cycles per minute.



Model 4000
— straight-line, two-pad air sander with longer, slower stroke, 2100 oscillations per minute, 9 lbs.



Model 1000
— straight-line air sander with big abrasive area, operates at 2500 oscillations per minute, palm lever control, 7½ lb.



Model OE-900
— electric — heavy duty, high torque, constant speed. Not damaged by overload. No belts, gears or brushes.

Model SP-101
— straight-line, single-pad air sander, 3000 oscillations per minute, 5 lbs.

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All air sanders suitable for wet or dry sanding; electric sander for dry work only.

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Division of SUNDSTRAND CORPORATION

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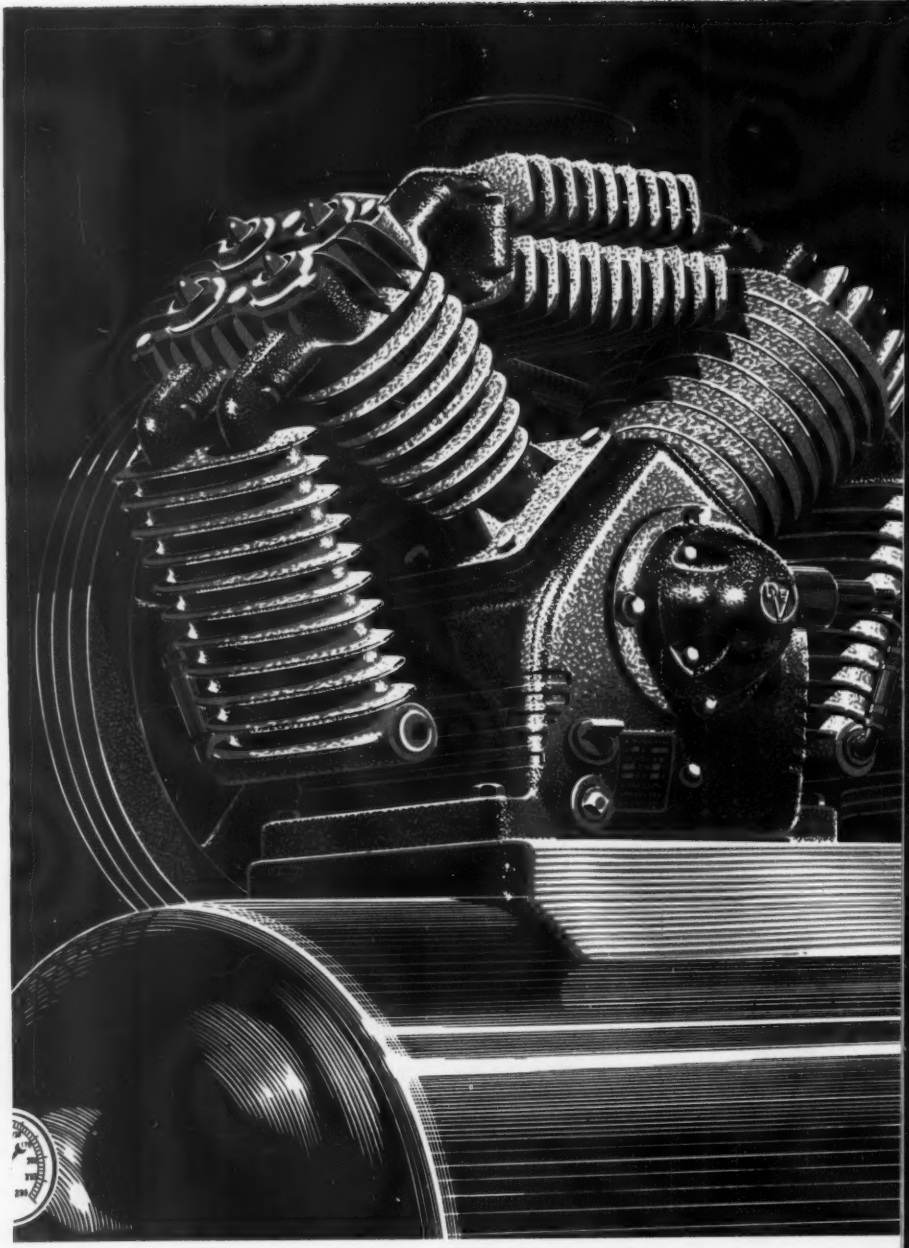

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". . . the iron phosphates do not increase corrosion resistance to the extent that zinc phosphates do . . ."

about the structure, the nature of the crystal or other qualities.

Coating weight is merely a classification. If you speak of a 50-mg. coating, everybody knows it's an iron phosphate. If you are speaking of 150, it is probably a zinc phosphate. If you mention 400, you may be speaking of a zinc phosphate dip. If you say 1000 or 2000, everyone knows it's the manganese or zinc type for holding oil. Let's not speak of coating weights other than as a general identification of type.

What are some of the most common problems in iron phosphatizing?

In using iron phosphates, the finisher may have difficulty in removing the compound from the container. Although this product is shipped in granular form, there is some moisture in most of the compounds, and under the right conditions, this can cause "packing" in the container.

A frequent trouble with iron phosphates is related to some of the problems we have already discussed. Most iron phosphates contain surfactants as well as phosphates because they are expected to clean as well as phosphatize. Obviously this is a compromise, and if you have soils that are especially difficult to remove, the product may not be cleaned thoroughly.

As we have said before, the iron phosphates do not increase corrosion resistance to the extent that zinc phosphates do, and this sometimes leads to complaints about not being able to pass salt-spray tests. The tests that iron phosphate fails are usually those that you'd expect only zinc phosphate to pass.

One other trouble that's encountered by finishers from time to time is that of phosphate coatings showing irridescence through the paint. Other problems and solutions are shown in the tables on pages 82, 83, and 84.

If a phosphate coating is damaged in handling before paint is applied, would you strip it and recoat, or rephosphatize without stripping?

Most finishers phosphatize the whole part again, without stripping the previous phosphate coating.

How do you choose between a chromate coating and a phosphate coating when painting aluminum?

I don't believe that anyone has been too successful in getting a real phosphate coating on aluminum. What they're actually getting is an etch. On aluminum, we recommend chromate coatings.

Why would chromate coatings be better for aluminum?

Corrosion resistance is better, for one thing. Phosphate coatings do not improve salt spray resistance of aluminum as much as the chromate coatings do. Phosphates intermingled with chromate chemicals produce colored architectural decorative effects. But these mixed coatings don't have as much corrosion resistance as a straight chromate coating.

When the paint film is broken, phosphates on aluminum permit corrosion creepage to begin rapidly.

(continued)

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"Another important advance in phosphatizing is the discovery made by Jernstedt . . ."

How have phosphate coatings been improved in the past ten years?

One improvement is the development of "low-temperature" phosphate coatings. Ten or 15 years ago in the United States, it would have been quite unusual to phosphatize at room temperatures. Now there are several good processes for doing this.

What are the advantages of low-temperature phosphatizing? Are there instances in which it cannot be used?

The outstanding advantage of low-temperature phosphatizing is the cost saving which is realized through use of less heat.

With respect to zinc phosphate processes, there are very few instances in which low-temperature baths cannot be used. I think low-temperature phosphatizing will be used increasingly in the future.

The operators are certainly more comfortable in hot weather in shops that have lower-temperature phosphate-coating baths.

One other advantage is that we get finer, smoother coatings at low temperatures and these coatings have as much resistance to water immersion and corrosion as the high-temperature coatings—even better in some instances.

How about sludge formation in low-temperature baths?

There will be moderately more sludge at low temperature, but it is only moderately more and I don't think this would be a serious consideration.

What other advances have been made recently in phosphatizing?

The so-called iron phosphates now have improved surfactants and detergents. Improved package conditions have resulted from use of chemicals that allow packaging of more acidic materials without causing packing in the container.

Another important improvement is reduction of "post-rusting" when using iron phosphates.

What do you mean by the term "post-rusting?"

There are often delays in drying parts after phosphatizing. Since iron phosphates don't deposit a very substantial coating in the first place, yellow rust sometimes develops. We call this "flash-rusting" or "post-rusting." The chemicals now used don't absolutely prevent "post-rusting" and they're not rust-proofing, but they do retard formation of rust.

Another important advance in phosphatizing is the discovery made by Jernstedt at Westinghouse. He found that minor traces of titanium compounds bring some change about on the surface of steel and other metals—a change that promotes finer, tighter, closer-packed phosphate crystals in subsequent phosphatizing. The titanium compound has to be introduced and combined with an activating salt in just a certain way. Small amounts of this are added to the alkaline cleaner and/or used as a special dip. The effect, although we don't fully understand just what causes it, is to produce a fine, closely packed, dense phosphate coating.

(continued)

Many have claimed it

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New *BELKE* material combinations and application processes produce Plastisol Coating that actually withstands Trichlorethylene degreasing solutions and in addition withstands plating solutions.

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You can test this new coating in your own Trichlorethylene solution without cost or obligation. For FREE test panel with the new coating send chemical content and working temperatures of the different solutions to which the coating will be subjected.

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Are these activators normally used in the cleaner?

They're ordinarily added to the cleaner because it's more economical to do it this way. Theoretically, the activators would be better used alone: clean, rinse, then dip in activator made from ½ oz. of the Jernstedt salt to a gallon of water, then a water rinse, and then phosphatize. But that introduces two extra stages and its economically not very feasible in most installations. So as a second best thing we add activator to the alkaline cleaner.

In your opinion, is the conventional salt spray a satisfactory test for evaluating phosphate coatings' corrosion resistance?

I believe it's a reasonably satisfactory way of evaluating phosphate coatings. Of course, salt-spray results largely depend upon the quality of the paint used over the phosphate coating. We use a rather mediocre paint for salt spray tests. We get results faster and yet the paint is good enough that you can compare phosphate coatings. We ordinarily run salt-spray tests and water-immersion tests and then consider results of both.

Are there phosphate coatings better suited to "forming the product after finishing?"

Either the iron type or a very thin, tight zinc phosphate, which means good activation, using the Jernstedt activator.

How does the phosphate coating used prior to application of drawing compound differ from that applied prior to painting?

Many people recommend a thick, porous coating, even manganese coatings. We believe the thin, tight coatings are best. About 400 mg./sq. ft. is just as good as 3,000.

Coming Up

Watch for these useful articles in coming issues of PRODUCTS FINISHING, the leading publication in the finishing field:

Colloid Plating
An award-winning paper on a method of plating delicate threaded parts in jelled plating solutions.

Timken's Process for Phosphatizing Bearings
Phosphate coating reduces scuffing and scoring, improves corrosion resistance . . .

Outdoor Exposure Confirms Laboratory Tests on Thicker Chromium Plate
Seashore exposure shows that corrosion resistance is better . . .

Lightweight Ovens Hang from Conveyor Rail
Aluminum-skinned ovens can be installed or moved easily . . .

Precision Buffing of Weights for Analytical Balances
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Conveyor Breakdowns Eliminated with new electro-mechanical control and safety device. Racks can't be pushed into sides of tank; load can't drop if power fails during work transfers.

Positive 6-Point Connections. Self-cleaning heavy duty contacts need little or no attention.

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Fast Cycle Changes by shifting tank partitions and moving pick-up heads.

No Extra Headroom Required. All elevating mechanism operates below top of rack carrier.

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If More Than One Cycle is necessary, by-passing can be built in.

Hydraulic operation, standard. Pneumatic operation, optional.

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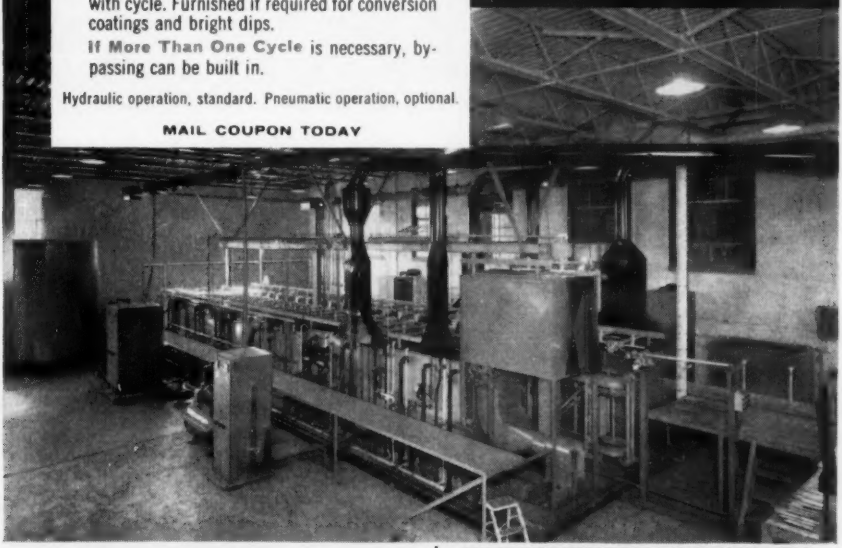

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"Ride-the-Rod" Painting Machine

An automatic painting machine recently introduced by Finish Engineering Co. is designed for painting large numbers of small parts, especially where multiple coats are applied. It is particularly useful in shops that coat parts before and after vacuum metallizing.

Parts are mounted on spindles for painting. The spindles are mounted on rods which can be lifted off the painting machine's conveyor.

With this system, a carrier rod can be loaded with parts while the painting machine is running. In this way, production stops only long enough for loading and unloading the long rods of 20 or 30 parts, rather than for the time necessary to mount each part individually on spindles.

The rods also can be used for taking parts through other operations: cleaning, baking and vacuum metallizing.

The machine can be used with rotating or non-rotating work holders.

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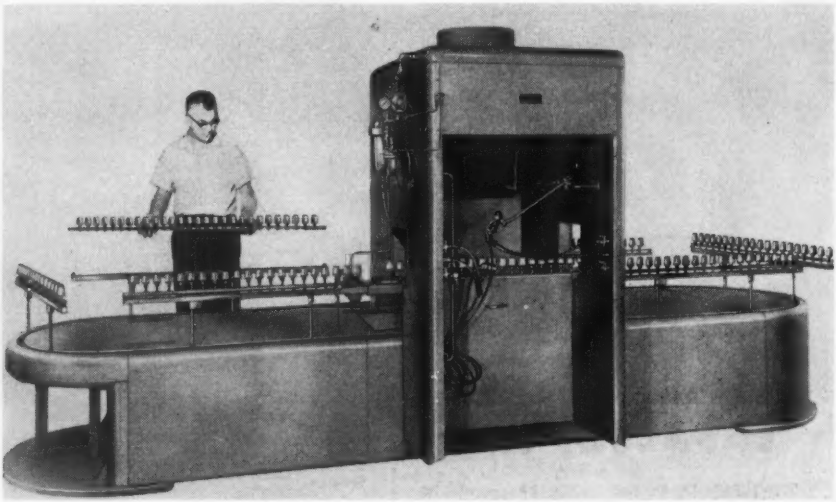
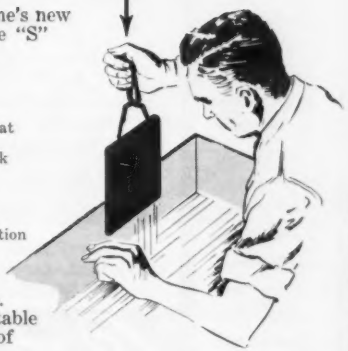


"Ride-the-Rod" Painting Machine: removable rods save time, are used in other operations

red smut?

not on this blackened steel

No red smut forms on any iron and steel parts when Enthone's new Ebonol Additive "S" is used in blackening baths. Additive "S" effectively holds in suspension dissolved iron and copper, preventing deposition of red smut on the work.



ADVANTAGES OF ADDITIVE "S" ARE:

- Eliminates red smut
- Produces deeper black
- Shortens blackening time
- Permits lower blackening temperature
- Increases production
- Improves ability of present baths to coat hard-to-blacken alloys
- Maintains corrosion resistance of black oxide coating
- Permits blackening of copper-brazed steel parts
- Costs less than other methods of controlling iron and copper contamination

Ebonol Additive "S" is used in all steel blackening baths which contain oxidizing agents and caustic soda and produce a coating in the 285°-305°F temperature range. It is a concentrated solution of blended complexing agents stable to oxidizing agents, high alkalinity and high temperatures of blackening baths.

Visual observation of the work is the only control required. At the first sign of red smut, add 1-2 ounces of Ebonol Additive "S" to each gallon of solution.

For complete information, write to Enthone, Inc., 442 Elm Street, New Haven 8, Conn.

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Speed is adjustable—from 200 to 600 carrier rods per hour.

Manufacturer: Finish Engineering Co., 921 Greengarden Rd., Erie, Pa.

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★ ★ ★

Barrel Finishers

A line of five barrel finishing units designed for finishing and definning both metal and plastic parts has been introduced by Tumb-L-Matic, Inc.

The line incorporates barrels from 21 inches in diameter and 20 inches long to 30 inches in diameter and 48 inches long.

Type LS machines include, as standard equipment, welded channel iron framework, octagonal patented sheet steel barrels with hard maple liners, guarded chain drive, variable-speed

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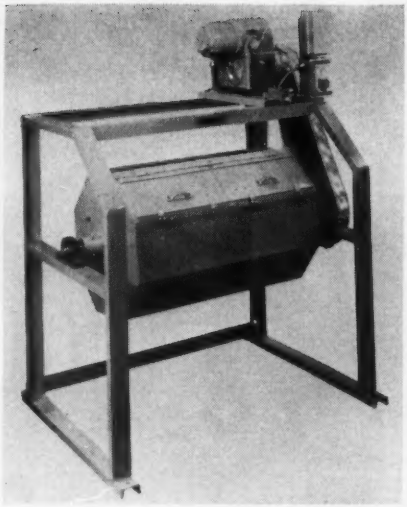
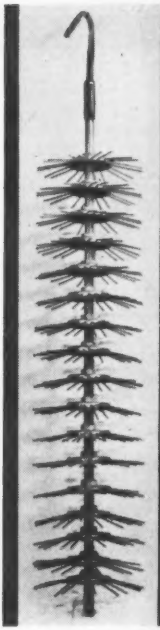


Tumb-L-Matic Model LS: for deburring and definning various metal and plastic parts



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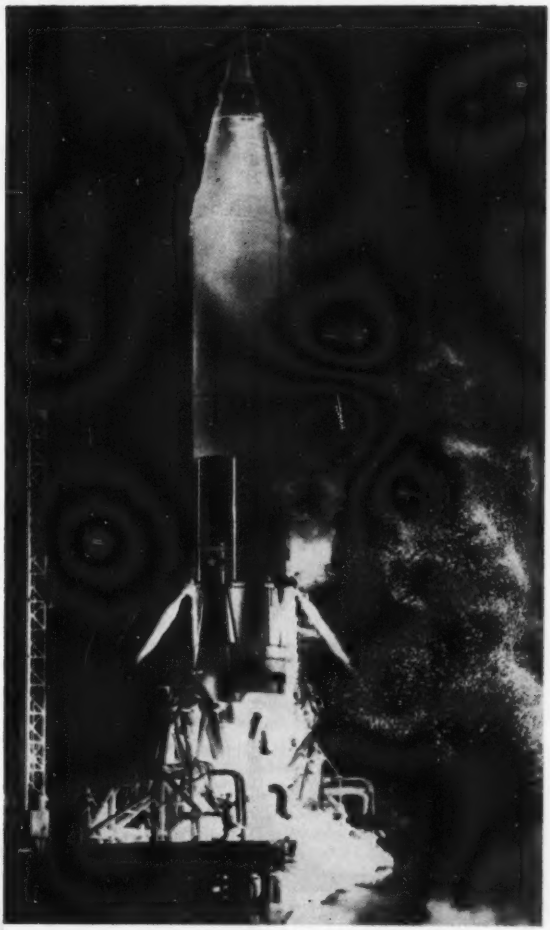
—Elco Corporation, Philadelphia, Pa.



The failure of a single component can put even the mighty Atlas Missile out of commission. That's why an electroplate of SEL-REX BRIGHT GOLD is specified to give an extra measure of reliability to Elco's patented VARICON Contacts used in missiles, rockets, computers and similar critical applications.

The VARICON Contact, with its fork-like design and 4 coined mating surfaces, offers exceptional resistance to numerous punishing insertions and withdrawals—meeting or surpassing the most exacting specifications. Patented SEL-REX BRIGHT GOLD, which produces a fine grained, dense electroplate—twice as hard as conventional 24K Gold plate — is a major reason for the reputation of quality and reliability enjoyed by VARICON throughout all industry.

SEL-REX makes the world's largest selection of processes and systems which take the guesswork out of plating with precious metals. Baths are simply maintained with scientific precision by additions of pre-measured salts or solutions. Your assurance of consistent quality results from one batch to the next.

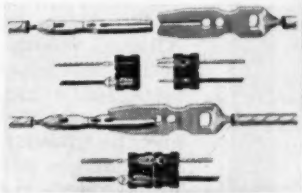


Photo shows Elco's patented Varicon Connectors and unique fork-like contact plated with Sel-Rex Bright Gold.

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motor, unloading tray and screens and removable door with quick-opening latches.

Optional equipment available includes loading hopper and unloading chute, expanded metal screen enclosure on both ends and rear, safety door providing limit switches interlocked with control system, magnetic brake on extended motor shaft and electrical push-button brake release.

Manufacturer: Tumb-L-Matic, Inc., Stamford, Conn.

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★ ★ ★

Dry-Film Rust Preventive Survives 23-Month Outdoor Exposure

A 23-month outdoor exposure test has proved the effectiveness of a transparent, plastic, dry-film rust preventive.

The heavy-duty rust preventive is Rust Veto 342, a product of E. F. Houghton & Co.

In the test, pieces of butt-welded pipe were exposed on a Philadelphia laboratory rooftop for 23 months. Two pipes were coated with Rust Veto 342 and one was left uncoated.

After 2 weeks, the uncoated pipe was covered with a bright rust. After 23 months, both coated pipes were fully protected from rust and the transparent film was still non-tacky and plastic. Then, one coated pipe was tested to see if the protective film was still easy

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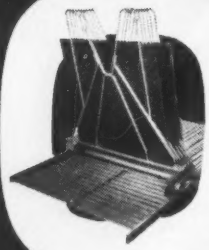
SICON® PROTECTS even in HOT OVENS



Young Brothers Co., Cleveland, a leading manufacturer of industrial ovens for the metal decorating field, uses SICON finish to protect oven wickets. Printed metal sheets are oven-dried before being formed into signs, cans, etc. As they pass through the 100 ft. oven the Sicon-coated wickets hold them in position as shown. SICON has proved most satisfactory because it keeps wickets clean, rust-free, and unaffected by temperatures in the 400°-600°F. range. Why not try SICON on your product! Write Dept. B-6.

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Harshaw announces

NiChlor 31

a significantly improved nickel chloride

IMPROVEMENTS:

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- **Contains more nickel —less bulk**
- **Easier handling**
- **More uniform particle size**
- **Same cost per pound of nickel**
- **Quick dissolving characteristics**

A new nickel chloride with less water of hydration demonstrating marked improvements over that previously available to Platers has been developed by The Harshaw Chemical Company.

Called "NiChlor 31," this new product has a typical average of 31% nickel compared with 24.5% in ordinary nickel chloride. This means that .8 lb. of "NiChlor 31" is equivalent to 1 lb. of regular nickel chloride, and results in easier handling and storing.

"NiChlor 31" is non-caking, uniform, and of high purity with quick dissolving characteristics. On the basis of nickel content, "NiChlor 31" is offered at no increase in cost.

Complete information may be obtained by contacting The Harshaw Chemical Company, 1945 East 97th Street, Cleveland 6, Ohio.

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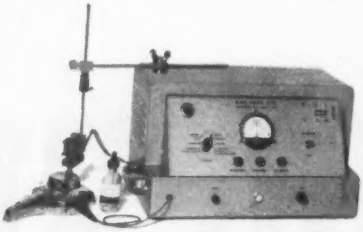
Here's Model 955



Everything you need in a Plating Thickness Tester!

1. WIDE APPLICATION!

Determines the thickness of most common deposits on various basis metals.

2. WIDE THICKNESS RANGE!

Minimum thickness for Model 955 is 2-3 hundred-thousandths of an inch (2-3 millionths for decorative chromium). For testing thin deposits, Accessory Model MT provides direct readings in millionths of an inch.

3. VERSATILITY!

Test plane, or curved surfaces down to ¼" diameter . . . composite coatings with individual readings of actual thickness. Accessory WT is used for deposits on a wide range of wire gauges.

4. ACCURACY!

Accuracy 90-95%. Human error virtually eliminated. "Calibration" feature monitors both accuracy and performance.

5. SIMPLE OPERATION!

Just set up the specimen . . . set the selector switch . . . and press the button. Average test requires about one minute . . . readings are direct.

6. GUARANTEED SATISFACTION!

First, let us evaluate your application . . . no cost, no obligation. Try Model 955 in your own plant for 15 days. See for yourself . . . what it does . . . how it suits your needs.

Write for Bulletin 400

KOCOUR COMPANY

4814 S. St. Louis Avenue

CHICAGO 32, ILLINOIS

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to remove. The Rust Veto coating was easily removed with solvent.

According to Houghton, Rust Veto 342 is easy to apply and remove.

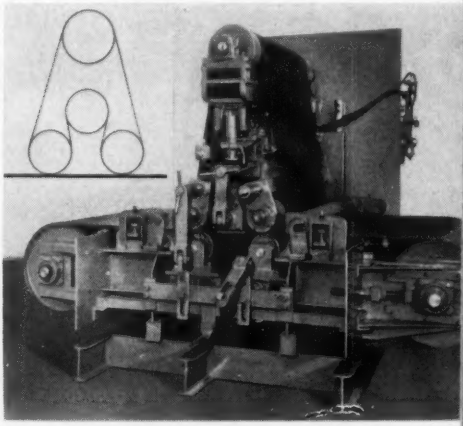
Manufacturer: E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pennsylvania.

For more data circle **3** on Postpaid Card

★ ★ ★

Abrasive Belt Polishing Machine Makes Dual Contact

Murray-Way Corporation has developed a sheet polishing machine with a single, endless abrasive belt that makes contact with the work twice in one pass. It is said to provide



Murray-Way Dual-Contact Polisher

double the surface finishing capacity of standard, single-contact flat polishing machines.

The machine utilizes a 60 inch-wide abrasive belt. Other belt widths may be specified. The dual contact rolls are oil resistant, statically and dy-

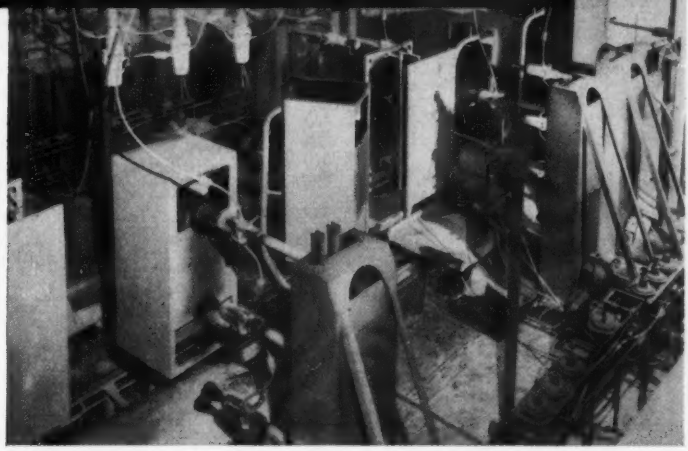
(continued)

NEW

RANSBURG MOVING BELLS

increase paint mileage . . . improve quality on

KELVINATOR REFRIGERATORS



Ransburg's No. 2 Process moving bells —latest innovation in electrostatic painting—automatically paint mixed sizes of refrigerator cabinets and doors on Kelvinator's new finishing line.

On this job—first of its kind—limit switches re-position the reciprocating bells to accommodate various model sizes mixed on the same line. And, electric eyes selectively trigger the paint on and off between parts.

RESULTS? Automatic electrostatic spray painting—which replaced a battery of reciprocating automatic air guns —is providing Kelvinator with a beautiful, higher quality, and more uniform finish. Rejects, formerly a troublesome problem, have been practically eliminated. And, along with appreciable labor savings in this highly automated set-up, paint mileage is substantially improved . . . even bettering the savings indicated in pre-installation lab tests at Ransburg.

RANSBURG

Like Kelvinator, other manufacturers of quality products will find Ransburg's moving bells the automation answer for production lines where batching of similar parts is impractical.

NO REASON WHY YOU CAN'T DO IT, TOO!

Want to know how Ransburg No. 2 Process can improve the quality of YOUR painted products—and at the same time—cut YOUR paint and labor costs? Write for our No. 2 Process brochure. Or, if your production doesn't justify automatic painting, let us tell you about the No. 2 Process Electrostatic Hand Gun which can be used in either conveyorized, or non-conveyorized painting.

RANSBURG Electro-Coating Corp.

Box 23122, Indianapolis 23, Indiana

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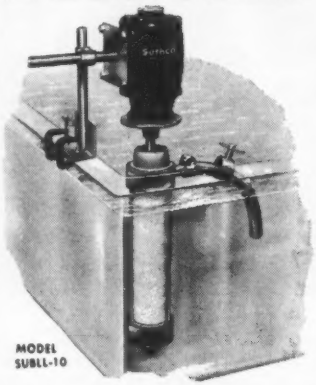
Sethco
submerged
UNIVERSAL
FILTER
SYSTEM

faster, full-view filtration
for all corrosive solutions



- compact, leakproof, non-aerating, continuous duty
- easy, trouble-free operation
- cartridge has heavier load capacity, replacement made in seconds
- fits anywhere on tank — saves floor space, no "jockeying" with hose lines
- high speed ⅛ hp motor for faster flow
- completely corrosion resistant
- quality-built throughout yet costs ⅓ less than heavier, cumbersome types

Sethco
MANUFACTURING CORP
2292 Babylon Tpk., Merrick, L. I., N. Y.
MAyfair 3-4220
Write or call for Spec Sheet No. 251

For more data circle 359 on Postpaid Card

namically balanced, and rubber-covered to any desired density.

The endless conveyor belt runs at speeds of 20 to 60 f.p.m.

The upper idler roll moves vertically under pneumatic presssure for automatic abrasive belt tensioning and rides in self-aligning ball bearings with taper locks. Oscillation of the idler roll is controlled by an automatic "air eye."

Contact roll spindles are outboard arm supported and are hinged so that abrasive belts can be replaced easily. Spindles and billy rolls are adjustable.

Manufacturer: Murray-Way Corporation, P. O. Box 180, Birmingham, Michigan.

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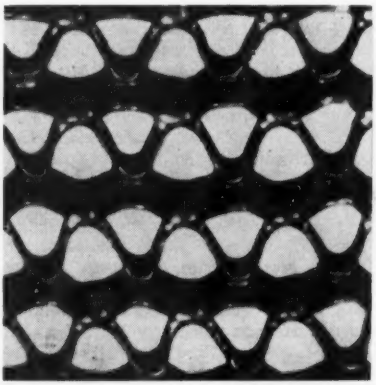
★ ★ ★

Rubber-Mesh Matting

An addition to its line of Neotex rubber mesh matting has been announced by Research Products Cor-



Symmetrical-Pattern Neotex Rubber Matting

poration. The rubber matting is used extensively for protecting delicate,

(continued)

There's a difference between infrared heat and far-infrared heat that may solve your heating problems

VISIBLE RED LIGHT
Does practically no heating

INFRARED
This is where "ordinary" infrared heaters work

FAR-INFRARED
Here's where the work really gets done right

When a heater radiates mostly far-infrared, long-wave-length heat, some wonderful things happen. Such radiation is color-blind—all colors dry at the same rate. Far-infrared heaters are operated at a lower temperature, reducing chance of scorching. There is practically no reflection of long-wave-length heat, so efficiency goes way up. These are a few of the reasons why so many heating, drying, and curing problems can be solved with this type of heat.

Here are the Corning radiant heaters that give you *far*-infrared heat.

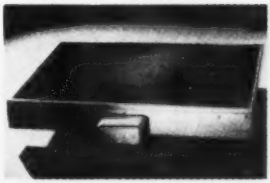
VYCOR® Tubular Heaters

These complete, ready-to-install units use 96% silica glass tubing for the radiant heat source. Resistance coils heat the glass, the glass emits the energy. Triple reflector design focuses heat directly on work. Fiberglas® insulation reduces heat loss to a minimum. Efficiency is up to 90%.

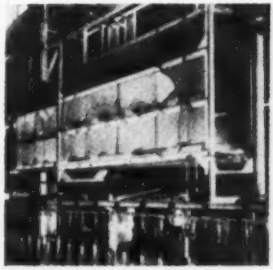
Heat-ups are fast—just three minutes to peak temperature. Cool-downs are equally rapid. The heaters have only a 10% current surge on start-up.

VYCOR heaters give you clean heat with no flaking or corrosion. The glass can take massive thermal shocks without breaking.

PYREX® Panel Heaters



Where you want particularly uniform heat over wide areas, we recommend this *area* source. No hot or cold spots. Only 10% current surge. The radiant energy source is a tempered borosilicate glass panel. One surface has an electroconductive film which heats the glass which emits long-wave energy. Each heater is complete and self-contained, ready to install.



Production went up 400% per kilowatt when these PYREX panel heaters went in at American-LaFrance. They dry 28 distinctly different colors of paint on fire extinguishers without process line interruption.

NEW BULLETIN—A new 16-page bulletin gives you complete information about both VYCOR and PYREX radiant heaters, how they work, design and installation details, and specifications. For your copy, write to Plant Equipment Sales Department, 96 Crystal Street, Corning, New York

*Trademark of Owens-Corning Fiberglas Corp.

CORNING GLASS WORKS
CORNING MEANS RESEARCH IN GLASS

For more data circle 360 on Postpaid Card

highly polished or painted surfaces in transit; on work benches; in tote boxes; and in many other places.

The recently introduced product has a "Symmetrical" pattern, and the manufacturer claims that because it is softer and more pliable, its function is expanded. It is produced in rolls 26 inches by 50 feet, and can be easily cut to any desired size or shape.

Because of the open mesh pattern (approximately 750 openings per square foot) air and water pass freely through and under the matting—an important feature for sanitation. And sterilization may be accomplished by boiling or autoclaving without affecting the neoprene.

Manufacturer: Research Products Corporation, Madison 1, Wisconsin.

For more data circle **5** on Postpaid Card

Lead Anodes With Aluminum Hooks

Lead anodes with corrosion-resistant aluminum hooks which will withstand the fumes from high-speed chromium plating solutions, have been introduced by Republic Lead Equipment Co. Because these extruded aluminum hooks will not corrode and pit, positive electrical contact between bus bar and hook is maintained undiminished throughout the anode's service life.

The aluminum hook is homogeneously bonded to the anode using an exclusive non-metallic flux and specialized techniques.

The aluminum used in Republic aluminum hooks gives them an electrical conductivity of 53 per cent, slightly above that of the extensively used cast copper hooks, which have a conductivity of 45 to 50 per cent, depending upon impurities. They are avail-

(continued)

New Roll Type Cover
Cuts Solvent
Losses 50%
BARON ECON-O-LID
FITS ALL VAPOR DEGREASERS
Rolls open, rolls closed with fingertip ease, keeps costly solvent vapors locked in. Installs easily, gives full access to work area.
• Hand operated or automatic models.
• Available in any width or length.
• Resistant to vapor degreasing solutions.
• Prices start at $55.00.
Write for complete specs and prices.
BARON INDUSTRIES
241 West Avenue 26, Los Angeles 31, California

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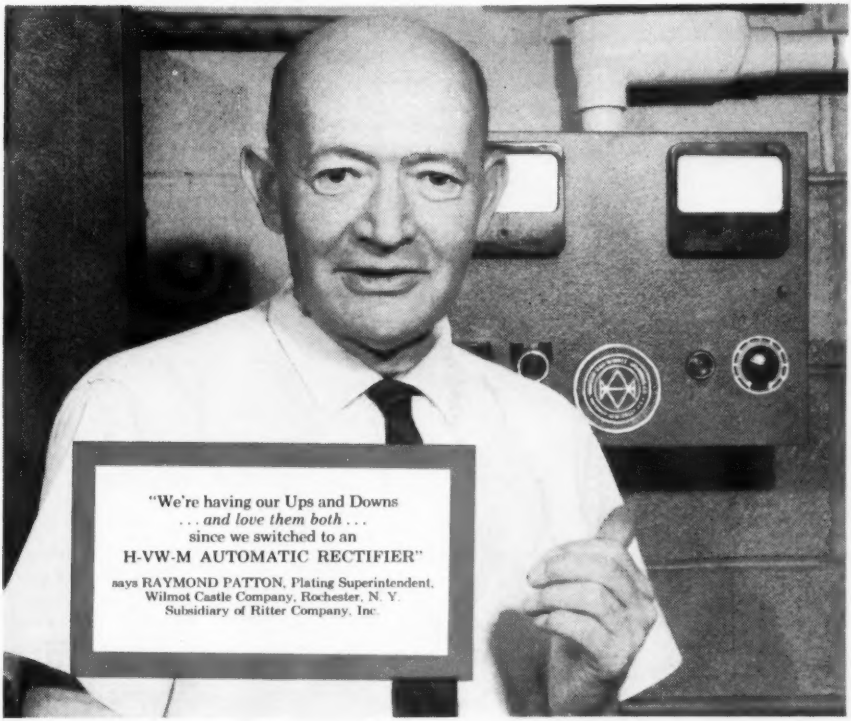

"We're having our Ups and Downs
... and love them both ...
since we switched to an
H-VW-M AUTOMATIC RECTIFIER"
says RAYMOND PATTON, Plating Superintendent,
Wilmot Castle Company, Rochester, N. Y.
Subsidiary of Ritter Company, Inc.

UP 5% goes production...
DOWN 25-30% go dial manipulations

Requirements for current vary widely in the chrome-plating operations of Wilmot Castle Company, one of the largest makers of sterilizers, lamps, and other hospital, dental, surgical equipment.

Added to the normal trickiness of chrome is the fact that the company plates some 300 different parts—ranging from a few ounces to 50 lbs. in weight. With the manual tap-switch rectifiers used before, a lot of time was spent in twiddling dials to meet correspondingly large swings in current needs.

But now... with the new Automatic Rectifier from H-VW-M... dial setting remains the same. Current is adjusted automatically for changes in load. With human error removed, rejects are down 5%. Plate is more uniform—for while the old method provided 44 steps of control, with Automatic Voltage Stabilization, control is stepless, virtually infinite.

Says Ray Patton, Wilmot Castle's plating superintendent: "We're gradually retiring all our rectifiers of the tap-switch type—and putting in H-VW-M units that practically think for themselves. We've found that what they seem to think about the most is ways to up our production, cut our costs down."

If that kind of thinking appeals to you—whether you're doing chrome-plating or any other kind—phone or write H-VW-M for details on the most complete line of plating rectifiers featuring Automatic Voltage Stabilization.

H-VW-M *Progress in metalfinishing through advanced processes • equipment*

Hanson-Van Winkle-Munning Company, Matawan, New Jersey • Offices in Principal Cities
Alert Supply Company is H-VW-M in the West • Los Angeles • San Francisco

For more data circle 362 on Postpaid Card

able in both flat and knife edge types and can be furnished with Republic's hollow round, solid round, rectangular ribbed and flat types, and as conforming anodes.

Manufacturer: Republic Lead Equipment Co., 7930 Jones Rd., Cleveland 5, Ohio.

For more data circle **6** on Postpaid Card

Automatic Dust-Collectors: Self Cleaning

Automatic dust collectors that clean themselves while operating have been announced by Torit Manufacturing Company.

The automatic unit cleans itself in three ways: periodic shaking of cloth filter tubes combined with reverse airflow through the filters; continuous removal of collected material by an adjustable screw conveyor at the base; discharge of collected material through a rotary feed valve.

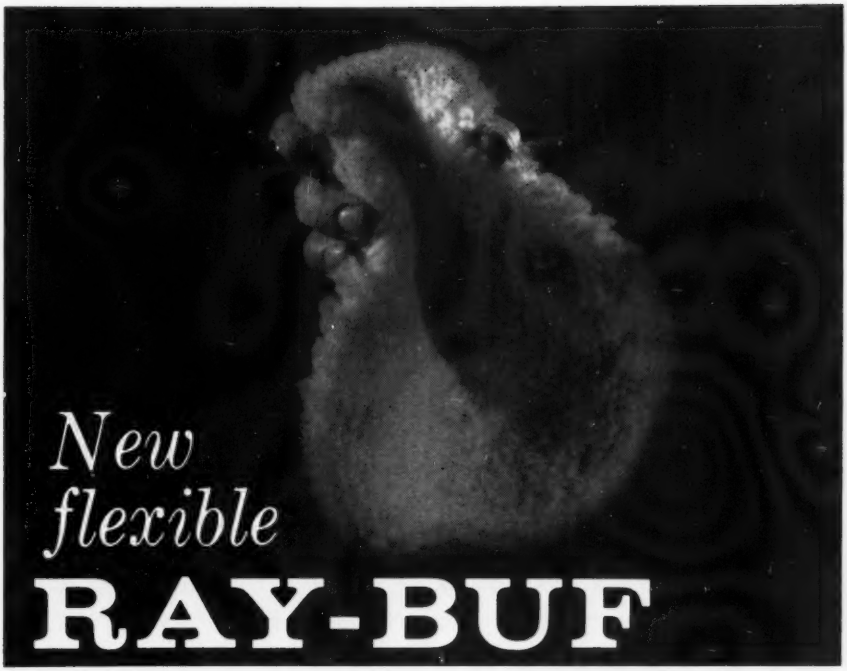
Built in modular sections, Torit's Automatic adapts to varied dust - collection and space requirements.

Eleven automatic models are offered, ranging from 2 to 12 in the number of sections they incorporate.

When cleaning itself, the unit periodically shuts down each section for a time to create a vacuum and a reverse airflow that blows dust from filters in that section. This, coupled with vigorous shaking of each filter in turn, eliminates need for compressed air. Air filtered through the unit can be recirculated, if desired.

(continued)

Now! REMOVE
hard-to-clean
PIGMENTED
DRAWING
COMPOUNDS
FAST!
■ leaves no lime deposits
■ keeps lines and nozzles clean
■ rinses completely
WITH
DuBois
Chemicals
422
INDUSTRIAL SPRAY WASHER COMPOUND DELUXE
Probably the most effective cleaner for use in spray washing machines. Safe on soft metals as well as steel. Emulsifies grease and oil completely. Contains special rust inhibitor. Requires no special handling. Harmless to workers' skin.
DuBois formulates many cleaning compounds for the metal working industry. Get the facts from your nearby DuBois' Mr. Du, listed in Yellow Pages under "Cleaning Compounds".
DuBois Chemicals, Inc. • Broadway at 7th • Cincinnati 2, Ohio
HIS
For more data circle 363 on Postpaid Card



The new all-purpose pad for *guaranteed* even polishing

Ray-Buf's new design puts all tufts in controlled circles, perfectly balanced and flexible for more even polishing on hard-to-reach surfaces.

Your polish reaches a higher luster faster, too, with Ray-Buf, because it contains only 100% combed virgin wool yarn. Pile is soft and deep—each tuft one and one-eighth inches long.

SELECTED FIRST-QUALITY YARNS make Ray-Buf keep its shape and resilience—stay soft and fluffy longer.

WASHABLE. Each tuft is firmly anchored to a strong canvas backing. Won't pull out even after repeated washings.

Mail coupon today for descriptive bulletin and complete details on the new *money-saving* Ray-Bufs.

Schlegel

MANUFACTURING COMPANY

P. O. Box 197, Rochester 1, New York

In Canada: Oakville, Ontario

Please send complete information on RAY-BUF, new all-purpose polishing pads.

Name.....

Street.....

City.....Zone.....State.....

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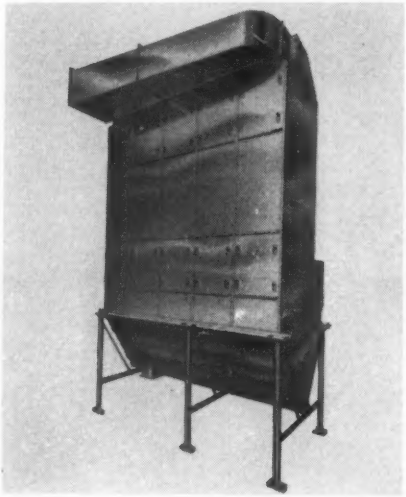

Dust Collector: cleans itself while operating

Up to 58,000 c.f.m. of air can be handled by a single 12-section model.

Manufacturer: Torit Manufacturing Co., 1131 Rankin St., St. Paul 16, Minnesota.

For more data circle **7** on Postpaid Card

★ ★ ★

Catalytic Screen Converts Gas To Heat Without Flame

Catalytic Combustion Corporation has developed a controllable, flameless, catalytic method of producing low-temperature infrared heat. Uses for this method include baking, drying, curing, bonding, preheating, softening, and evaporating.

In the recently developed process, LP gas is *directly* converted to infrared heat on a catalytically active metal screen. The screen itself is the radiant heat source. Direct conversion means increased efficiency and lower fuel costs, the developer reports.

Accurate temperature control makes it possible to hold surface temperature

Electro NON-FLAMMABLE

NO CURRENT
NO HEAT **Cold Stripper**

Save TIME and MONEY and EFFORT

Enamels, *even high bake*, vinyls, epons, hammers, wrinkles, alkyd paints, primers —in fact—every known hard to remove finish yields to ELECTRO COLD STRIPPER in quick time—often seconds. Eliminate the problem of paint build-up on conveyor baskets, carrying racks, hooks, etc., with an ELECTRO COLD STRIPPER in-line or batch set-up.

COMPLETE DATA AND TESTING SAMPLES AVAILABLE—GRATIS

ALLIED FINISHING SPECIALTIES CO.

2643 W. GRAND AVENUE • CHICAGO 12, ILLINOIS • PHONE: AR 6-2222

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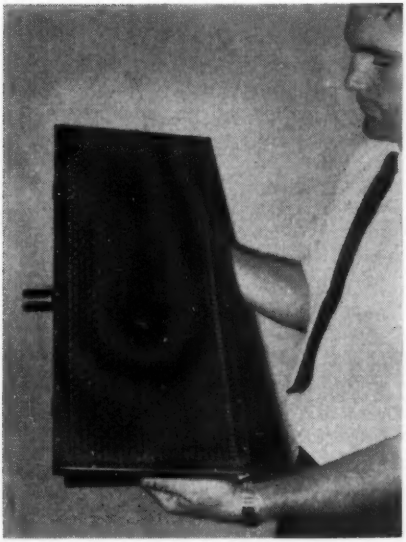


Catalytic screen: gas to infrared heat

of the catalyst screen between 800 and 1500 deg. F. by controlling gas flow.

The low temperature range permits work to be placed close to the infrared heat source to obtain optimum heat transfer efficiency. Heating times are shorter, production can be increased, and size and cost of necessary enclosures can be reduced.

Manufacturer: Catalytic Combustion Corp., 4725 14th St., Detroit.

For more data circle 8 on Postpaid Card

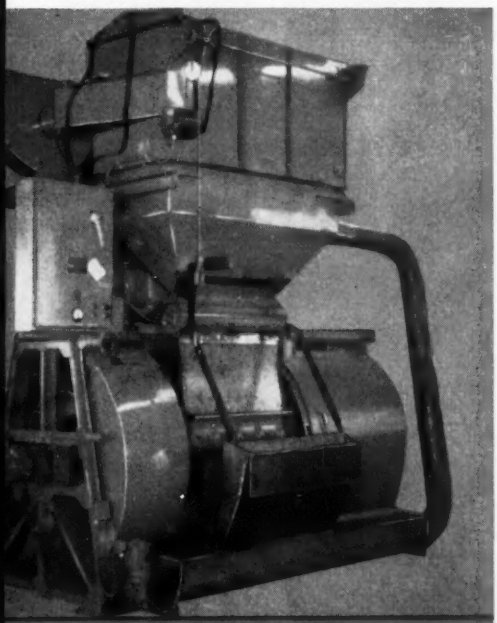
★ ★ ★

Coating for Aluminum

Aluminum treated in the Alcorite IV Process will withstand 250 hours of salt spray with little or no corrosion, according to the developer, Frederick Gumm Chemical Co., Inc.

In addition to the protective coating it provides, Alcorite IV improves paint adhesion.

(continued)



HARPER BUFFING MACHINE CO.

EAST HAMPTON • CONNECTICUT

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NO BUFFS NO FIXTURES

80% Savings on Labor and Materials by present users — same for short and long runs.

HI-G-Free Grain-ACTION can produce similar savings on over half the jobs now buffed.

FINISH — Equal or superior to Buffing. Intricate detail and complicated shapes preserved.

RANGE — All Metals — Most Plastics; sizes from watch screws to headlamps—

You can finish better for less with the HARPERIZER.

In addition, manufacturers of the finest automatic machines using wheels and fixtures to buff, deburr and polish.

Ask for a Demonstration
Write or Phone (ANdrew 7-2553)

HARPERIZER

Can be applied by dip or spray and has been approved by the U. S. Navy for compliance with Specification MIL-C-5541.

Manufacturer: Frederick Gumm Chemical Co., Inc., 538 Forest St., Kearny, N. J.

For more data circle **9** on Postpaid Card

Stable Colors For Anodized Products

An anodizing process which creates a wide range of durable colors on anodized aluminum has been introduced by Kaiser Aluminum & Chemical Corporation.

Called "Kalcolor," the process uses no organic dyes. Instead, colors are created during the process through conversion of alloying elements within the metal itself. Since tones in the coating result from reactions of alloying elements and chemicals in the anodizing bath, excellent color uniformity is achieved from one batch to the next. Colors available include gold, amber, tan, brown, olive, gray and black.

"Kalcolor" has been developed specifically for use with Kaiser architectural aluminum alloys, which are available as extrusions and sheet for use in commercial construction. It is available to the building industry through licensees established by Kaiser.

More than three years of exposure in various sections of the country caused no perceptible fading or corrosion in test

(continued)

STANZOIL
PIONEER
21 PIONEER GLOVES COMBAT
CHEMICALS
There's a Pioneer glove to protect workers from chemicals, chemical burns or hand dermatitis. Of the 59 Pioneer Glove styles, 21 are designed to give long service in at least 103 basic oils, greases, acids, solvents and other chemicals. This includes all of the long-wearing Milled Neoprene Pioneer styles that bear this recognized Pioneer trademark.
The PIONEER Rubber Company
285 Tiffin Road, Willard, Ohio

For more data circle 367 on Postpaid Card

Here's how TRUSSBILT . . . opened the door to improved quality in metal finishing operations

The TRUSSBILT DIV. of Siems Bros., Inc., St. Paul, Minn. . . . a leading manufacturer of flush steel doors used throughout the world; recently installed a tandem set-up of Timesaver "Speedbelt" Sanders in their steel door finishing line. Using a Model TOP and Model SPL, both face sheets of the doors are given a rough finish on the first pass through the line.

Low spots are then filled and doors are put through the line a second time for finishing. This provides a tremendous production advantage over previous hand operated methods, while eliminating variations in finish quality. The Timesaver line can handle approx. 100 doors an hour. This high speed finishing operation precedes dipping and baking operations, efficiently removing weld blemishes, while lowering high spots and smoothing out filled in valleys.

TRUSSBILT's experience is typical of Timesaver "Speedbelt" installations throughout the country . . . where the needs for better quality, better production and lower units costs is important. You, too, can enjoy the advantages of wide abrasive belt finishing and polishing in your shop at a minimum of cost. Investigate the advantages of Timesaver "Speedbelt" Sanders for your metal finishing and polishing operations, now!

TIMESAVER SANDERS

Write Today . . .

Send for literature and prices . . . or request an analysis of your finishing problem. No obligation.

Dept. Q-26
Box 7446 • Robbinsdale Station
Minneapolis 22, Minn.

For more data circle 368 on Postpaid Card

panels, the developer reports.

There also was no perceptible fading or corrosion of "Kalcolor" during accelerated tests, which included salt spray exposure for 15,000 hours, water fog for 7,000 hours, and high intensity ultra violet ray exposure for more than three years.

Developer: Kaiser Aluminum & Chemical Sales, Inc., Department NR-42, 300 Lakeside Drive, Oakland 12, Calif.

For more data circle **10** on Postpaid Card

Automatic Spray Coater Paints Electronic Components Loaded In Magazines

A spray-coating machine which automatically paints small components that are packed in detachable magazines has been introduced by Conforming Matrix Corporation.

The small components are loaded into magazines before the painting cycle begins. The magazines are then attached to the automatic machine's conveyor, which carries them through the spray painting station. Components spin during the painting cycle so that all areas are covered evenly.

Model HD-3 will accurately coat axial lead components at the rate of 3,000 to 10,000 per hour. It will also seal silicon diodes and other small electrical and electronic components. Capacitors, resistors and other components can similarly be clear coated to protect color banding and coding.

A traveling, remote, disposable masking strip confines the coating materials to the desired area and keeps the leads clean.

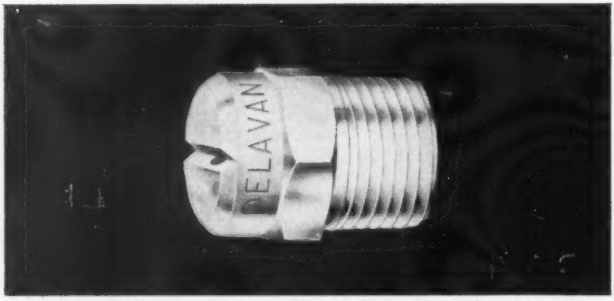
The use of an automatic tray loading machine

PROBLEM:

Metal cleaning—find a nozzle that resists corrosive liquids used in the cleaning and rinsing of metals.

SOLUTION:

Delavan PVC Type WF-P nozzle



The new WF-P nozzle is made of Polyvinyl Chloride. PVC offers excellent resistance to acids, alkalies, salt solutions and alcohols and provides for high operating pressures in temperatures up to 180° F. The WF-P delivers a flat, hard-hitting, uniformly distributed spray pattern. Its exclusive orifice design and tapered inlet assures maximum resistance to clogging. Its hex-shaped body permits easy installation and removal with standard or power socket wrenches. A wide selection of capacities, spray angles and pipe sizes is available.

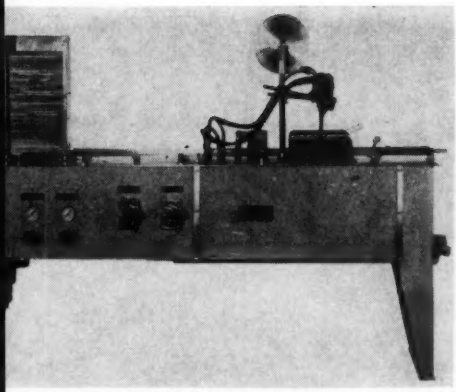
If the right nozzle will improve your metal cleaning operations, there's a Delavan nozzle that will do it better.

Write for Catalog 33.

DELAVAN Manufacturing Company

WEST DES MOINES • IOWA

For more data circle 369 on Postpaid Card



Automatic Coating of Electronic Components

in conjunction with Model HD-3 eliminates hand placing of components into the trays.

Manufacturer: Conforming Matrix Corporation, 356 Toledo Factories Bldg., Toledo 2, Ohio.

For more data circle 11 on Postpaid Card

★ ★ ★

Abrasive Blasting Media

Specially compounded abrasive blasting media incorporating emulsifying, suspension-aiding, and oxidation inhibiting agents. Called "Hydrabrasive," it requires no additives for use in wet-blasting.

Manufacturer: Hydra-Blast Mfg. Div., Automation Services, Inc., P. O. Box 5554, Fenkell Station, Detroit 28, Michigan.

For more data circle 12 on Postpaid Card

★ ★ ★

Ceramic Burner Plate

The Bonded Abrasives Division of The Carborundum Company has developed a ceramic burner plate for use in gas-burning equipment. This burner produces a blanket of flame high in infrared value that is completely uniform over the entire surface.

Manufacturer: Bonded Abrasives Div., The Carborundum Co., Niagara Falls, N. Y.

For more data circle 13 on Postpaid Card

THE
MAGNUS
METHOD

Looking for waste-points in your production? Then spotlight your cleaning operation, and the savings which can be achieved by the profit-geared team of Magnus chemicals, equipment and methods.

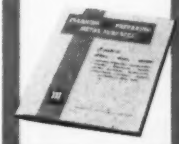
CLEANING COMPOUNDS

FREE

Here, in easy-to-read chart form, is your guide to the selection of the right material and method for the removal of all commonly encountered soils from a wide variety of metals.

CLEANING EQUIPMENT

FREE



This 32-page Guide to Better Cleaning combines basic cleaning information with specific examples of more than 1 types of equipment and cleaning techniques.

SPECIALIZED STRIPPERS

FREE

This fact-packed file folder permits the selection of the exact stripping compound to meet your individual need at the lowest possible cost. Strip even the new "hard-to-remove" finishes

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CHEMICAL COMPANY INC.

208 South Avenue, Garwood, N. J.

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Water-Displacing, Rust Preventive Oil

Patclin Chemical Co. has developed a series of water-displacing rust-preventives. They are recommended for use in preventing rust after deburring and burnishing operations. One of them is useful in preventing spotting out and staining after plating.

Three grades are available: No. 404 leaves a light, monomolecular film; No. 430 leaves a soft, non-drying film; No. 431 leaves a hard, waxy film.

Wet parts are immersed in these products to displace the water and leave a light, protective film.

Manufacturer: Patclin Chemical Co., Inc., 11-23 St. Casimir Ave., Yonkers, N. Y.

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★ ★ ★

Buffing Machine for Round, Oval or Rectangular-Shaped Parts

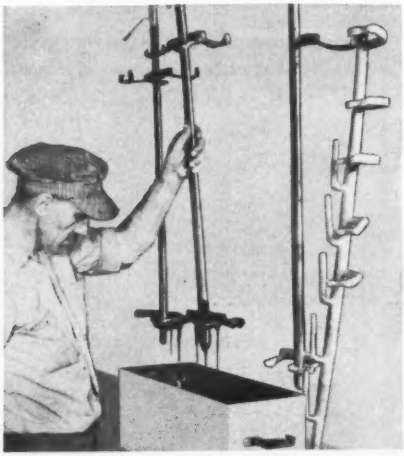
A double-head automatic polishing and buffing machine for finishing round or oval shaped parts or parts of rectangular shape with round corners.

Automatically cuts and colors parts such as electric fry pans, pots, skillets and metal bowls. Production rates of 60 to 150 finished parts per hour.

Automatic control of wheel pressure to suit part configuration. Air-line pressure directed to cylinders controlling the wheel - contact pressure is automatically varied when contact surfaces change from flat to curved.

The machine consists of two special Acme G-4 adjustable buffing lathes with floating, spring-loaded,

(continued)



P
C
7

AIR DRY RACK COATING

Requires no primer or special handling, won't contaminate solutions, eliminates underplating, compatible with all other coatings. Ideal for complete rack coating and patching PLUS protection of hoods, baskets, equipment and spillage areas.

Proven in use for over 14 years—order from your nearest distributor, or write direct for literature.

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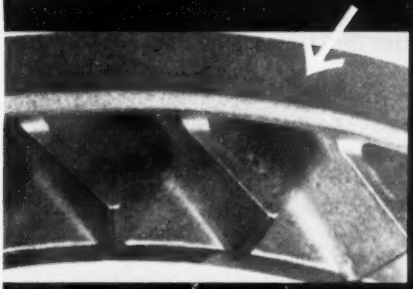
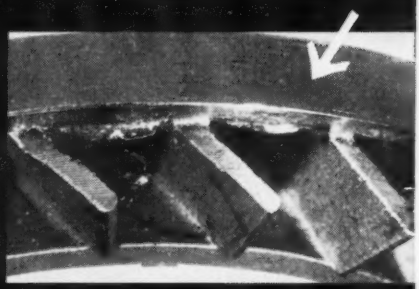
MICROBEADS GLAS-SHOT FOR BLASTING

CAN IMPART THIS MICROFINISH TO THIS SURFACE IN SECONDS





Microbeads Glas-shot are microscopic glass beads for use with all types of wet or dry blast equipment. You can use Microbeads Glas-shot for cleaning, polishing, peening or finishing of all materials normally processed with blast equipment. If you've never used Microbeads Glas-shot you're in for the surprise of your life.

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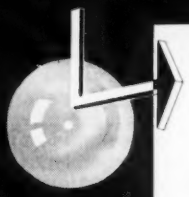

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☐ **Have representative call**

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Street _____

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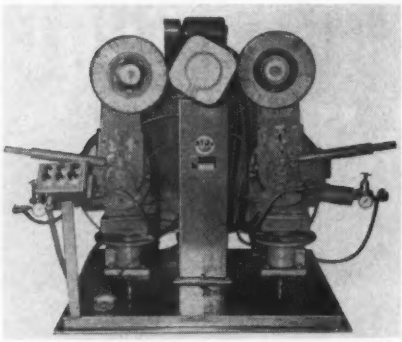

Acme self-contained double-head automatic buffing machine for finishing round, oval or rectangular parts having radius corners.

pivoted wheels, mounted on a common base with a revolving workholder.

Each lathe is equipped with a timer-controlled air cylinder which automatically pivots the buffing heads "in" for finishing operations and "out" to facilitate loading and unloading. Each lathe is separately timed so that one wheel will be retracted from the workpiece before the other. This permits a coloring operation to be performed during the last revolution of the part.

Each lathe is equipped with manual adjustments to raise and lower and provide "in" and "out" positioning of the buffing wheels and to compensate for wheel wear.

Manufacturer: Acme Manufacturing Co., 1400 E. Nine Mile Rd., Detroit 20 (Ferndale), Mich.

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★ ★ ★

Moving Bells: Electrostatic Painting System Changes Automatically According To Part Size

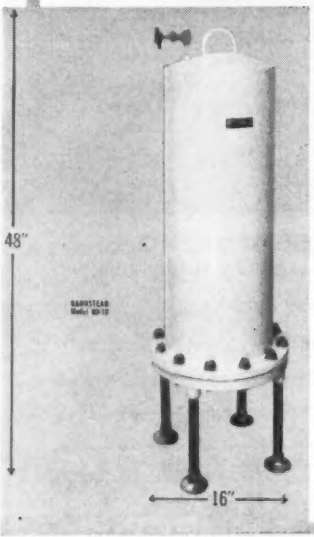
An electrostatic spray painting system with bell-type atomizers that move

(continued on page 122)

AT AMERICAN ELECTROPLATING...

BARNSTEAD

DEMINERALIZED WATER ELIMINATES REJECTS IN CLEANING, RINSING, AND PLATING OF LIGHT METALS



At American Electroplating, the Barnstead BD-10 with capacity of 1200 g.p.h. provides pure, demineralized water in making critical solutions for aluminum and magnesium castings. The plating solution for these components in missiles, and missiles control systems must be free of any kind of contamination caused by impure water The Barnstead BD-10 in use for over a year has completely eliminated rejects. Catalog #160 provides more Pure Water answers Write Barnstead Still And Sterilizer Co, 12 Lanesville Terrace, Boston 31, Mass

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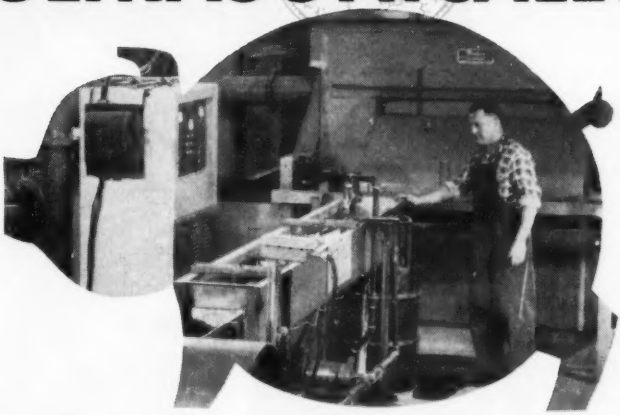

An experimental installation for removal of residual smudge from shot blasted strip by means of ultrasonics. A joint project of Pangborn Corp., Wean Engineering Co., Inc., and Branson Instruments, Inc.

The shotblast method of descaling strip is becoming more and more popular, especially among the lower tonnage producers, converters and fabricators. In this process, hot bands are descaled in a blast cabinet with abrasive shot.-Today ultrasonic cleaning is on the way to replacing flash pickling. This method, which eliminates stream pollution and acid disposal, offers many extras:

• LOW INITIAL INVESTMENT (for tanks due to inexpensive steel construction) • LOW MAINTENANCE COSTS • LOW OPERATING COSTS (in terms of heat and power input) • REDUCED OPERATING TEMPERATURES • LITTLE OR NO CORROSION • NO FUME REMOVAL • NO ACID DISPOSAL • SPACE SAVING (ultrasonic installations are shorter in length).

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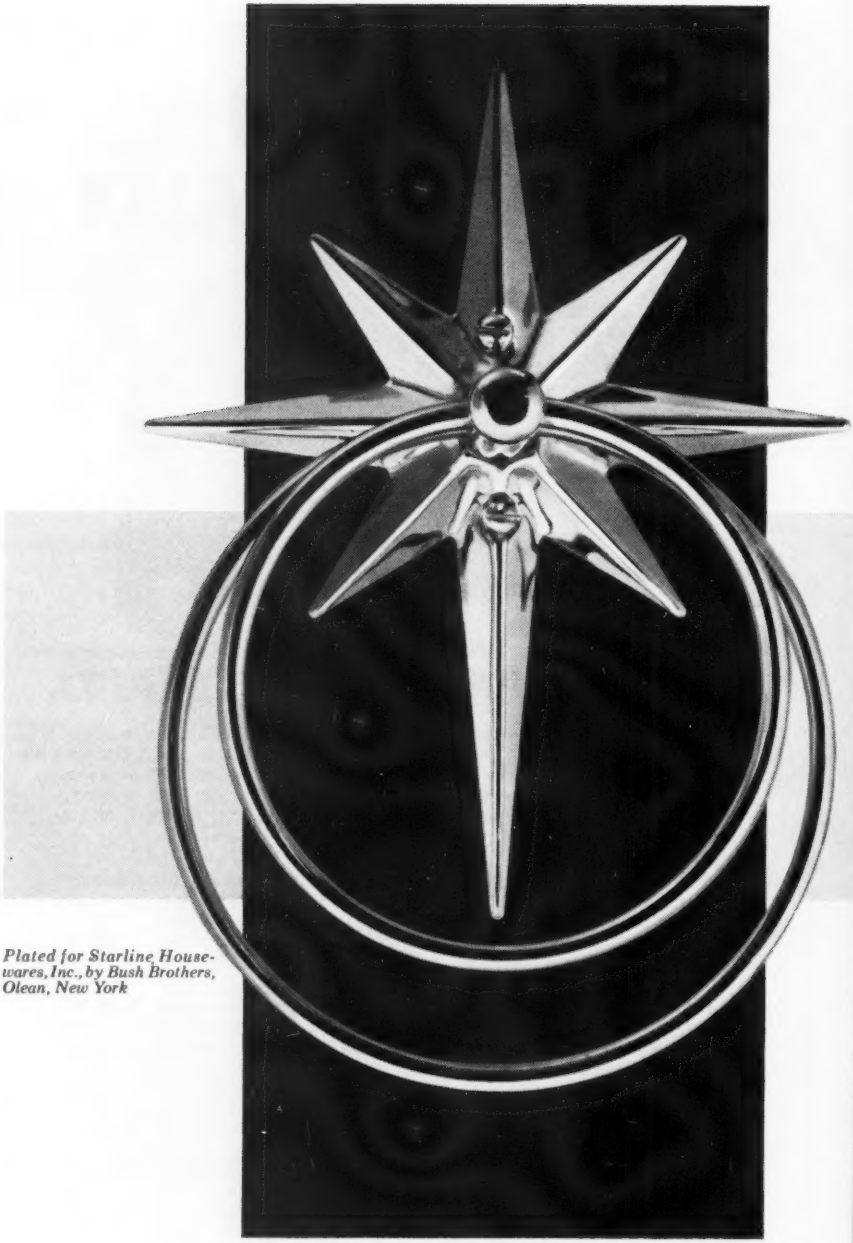

Plated for Starline Housewares, Inc., by Bush Brothers, Olean, New York

NO DEGREASING
NO DEBURRING
NO COPPER PLATING
NO COPPER BUFFING
on this nickel-chrome plated fixture

...just chrome over
SUPERLUME
on a raw steel stamping

It used to take *six* operations to get the high-luster finish demanded by Starline Housewares for this chrome-plated towel ring. Now it takes only *two*.

Difference in finish quality? *Absolutely none*, agreed the plating experts who scrutinized random samples from batches produced both ways.

Maybe Superlume belongs in *your* plant, too. This high-leveling, super-bright nickel bath is economical with most die castings and virtually all high-grade steel products. For technical details on these and other money-saving uses, ask H-VW-M.

H-VW-M *Progress in metalfinishing through advanced processes • equipment*

Hanson-Van Winkle-Munning Company, Matawan, New Jersey • Offices in Principal Cities
Alert Supply Company is H-VW-M in the West • Los Angeles • San Francisco

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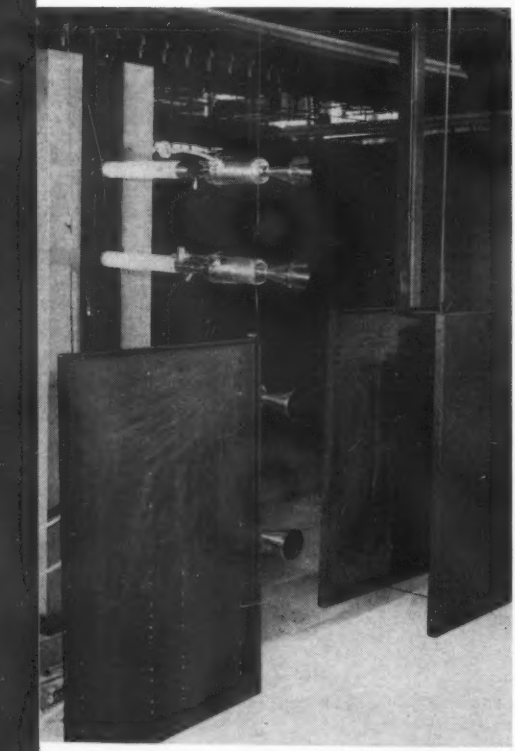
in and out and shut off selectively as required by the size of the piece being painted has been developed by Ransburg Electro-Coating Corp.

As the size of the parts being painted changes, a sensing device moves the bells closer or farther away from the surface of the parts.



In this application, only the two lower electrostatic atomizing cells would be used to paint the short shelving. The upper bells would turn on if longer parts come down the line. Bells are in retracted position to accommodate the wide double-hung shelves. They'll move forward to paint single shelf.

All guns are triggered automatically to spray only when articles are moving past, regardless of spacing on the conveyor chain.

Changes in height of parts being painted are handled by turning off the upper and lower bells selectively.

The system is designed for use in painting articles of various sizes where grouping according to size is impossible, Ransburg says.

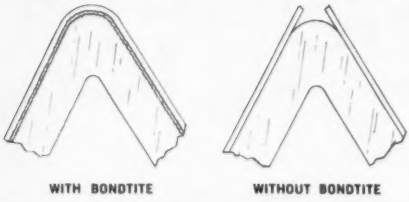
Manufacturer: Ransburg Electro-Coating Corp., Box 23122, Indianapolis 23, Indiana.

For more data circle **16** on Postpaid Card

★ ★ ★

Cleaner-Phosphatizer Combines Constant pH with Self-Cleaning of Spray-Washer Nozzles

Bondtite is a cleaning and phosphatizing compound that keeps spray nozzles clean and maintains a constant pH of 5 in any practical concentration.



Drawing shows beneficial effect of Bondtite

The Magnus product removes shop dirt, oils, and acid soluble soils and neutralizes alkaline residues from previous operations. It creates no sludge problems, Magnus reports.

Operating conditions recommended by the manufacturer: one to 4 oz./gal.; 140-180 deg. F.; one to 5 minutes exposure time.

Manufacturer: Magnus Chemical Co., Inc., Dept. X-50, Garwood, N. J.

For more data circle **17** on Postpaid Card

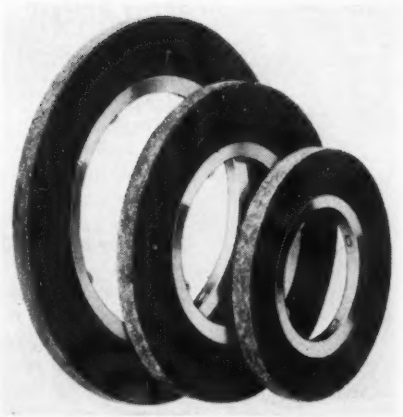
Power Brushes Designed for Precision Finishing

A line of power-driven brushes recently introduced by Osborn Manufacturing Co. is designed for holding closer tolerances in finishing, the manufacturer reports.

The Osborn brushes consist of wire cutting points encapsulated in plastic. They reduce peening and rolling of metal edges, hold edge blends to close tolerances.

They are useful in production finishing of pump gears and similar products requiring an 0.005-inch edge blend.

It is expected that the power-driven brushes will see extensive service in removing burrs and blending edges of ferrous and non-ferrous fine-pitch gears, removing flash from plastic parts, producing close-tolerance edge blends on clad metal products, and burr removal and edge blending of powdered metal parts.



Osborn "Master-Blend" Power Brushes: closer tolerances, less peening of edges

Manufacturer: The Osborn Manufacturing Co., 5401 Hamilton Ave., Cleveland, Ohio.

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SPRA-CON

COMPLETE FINISHING SYSTEMS

POWER SPRAY WASHERS

DRYING OVENS

PAINT BAKING OVENS

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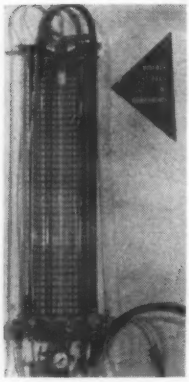
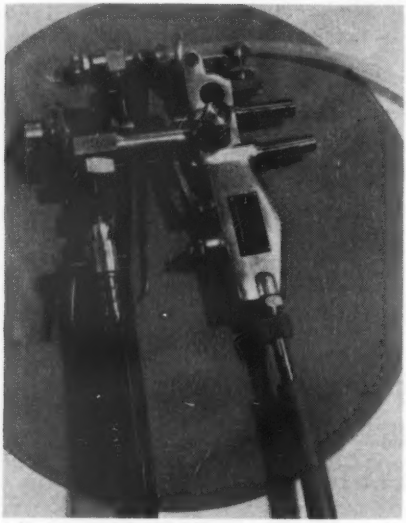
Two-Component Spray System



Transparent supply

Zippel equipment for applying catalyzed coatings feeds the two components to the atomizing nozzle by means of a pipe within a pipe. Actual mixing takes place outside the nozzle tip. A transparent container for the two components gives visible proof that proper quantities of each component are being fed to the spray gun. Air pressure forces the spray materials to the spray gun.



Zippel Two-Component Spray Gun

Information: Naftone, Inc., 425 Park Ave., New York 22, N.Y.

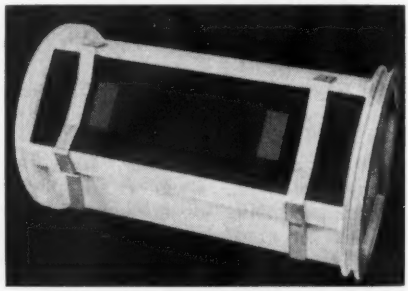
For more data circle **20** on Postpaid Card

Polypropylene Plating Barrels

Horizontal plating barrels of polypropylene are now made by Imperial Industries, Inc. This thermoplastic material is proving excellent for use in this application.

The Imperial barrels are equipped with Cycolac doors secured by stainless steel clamps. Models are available for either gear drive or belt drive.

It is lightweight (specific gravity .90) yet has great strength and abrasion resistance. It has excellent resistance to heat and chemicals. It withstands all temperatures and solutions normally encountered in plating.



Imperial Industries' Polypropylene Barrel

Manufacturer: Imperial Industries, Inc., 36000 Earl St., Wayne, Mich.

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Wetting Agent for Cyanide Zinc Plating Solutions

Kenvert No. 15-WA is a liquid wetting agent that emulsifies grease carried ino plating solutions; unplugs holes (in plating barrels) that have been clogged by breakdown of brighteners in the plating solution; lowers surface tension and improves drainage of plating solution from parts; forms a light foam blanket which retards fuming and decreases formation of salts on anode bars.

A product of Conversion Chemical

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Write today for specifications and **complete** descriptive literature on the **new** double-purpose **mersa-matic.**

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Preforms in over 300 shapes, sizes and bonds for all barrel and vibratory operations.

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Corporation, it also produces grain refinement and limited brightening.

Manufacturer: Conversion Chemical Corporation, Rockville, Conn.

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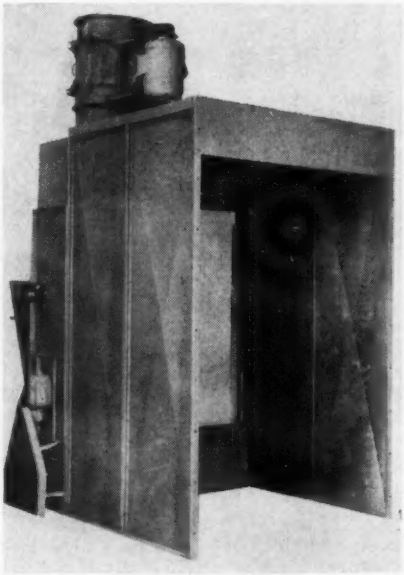
★ ★ ★

Spray Booth With Disposable Curtain

An automatic dry spray booth that collects paint overspray on a disposable curtain was introduced recently by Binks Manufacturing Company.



"Dispo" Booth: throw away the curtain

Called the "Dispo" booth, it collects paint overspray on a disposable cloth curtain mounted in the booth where filters are normally installed. The cloth is mounted on rollers so that it can be rotated when the exposed area

(continued)

The Pangborn Vibratory Finishing Machine . . .

THE LONGER YOU OWN IT, THE MORE USEFUL IT IS!

"Every day we find new pieces it can finish," comes the word from the large, Midwestern die-casting firm shown above. And no wonder!

This machine makes itself useful in many ways: cleaning, descaling, radiusing, fine-finishing, burnishing or coloring. It can do all this with metals, alloys, many types of plastic and ceramic parts . . . and at speeds up to 100 times faster than conventional methods. It can clean the intricate or shielded surfaces you can't reach with barrel finishing or other means.

Available in many sizes, the Pangborn Vibratory Finishing Machine is the most compact unit in its field. Its standard equipment includes variable speeds and exclusive air-cushioned suspension which assures automatic leveling and amplitude control. Auxiliary equipment, media and compounds available for every need.

Send parts with exact finish specifications, or finished specimen, for sample processing in our laboratory to: Mr. William E. Brandt, PANGBORN CORP., 5000 Pangborn Blvd., Hagerstown, Md.

Pangborn

OF HAGERSTOWN

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is saturated with paint particles.

The Dispo booth is designed to exhaust approximately 300 c.f.m. of air per square foot of cloth area at a maximum of 3 inches resistance pressure. As resistance pressure builds up, a pressure differential switch operates a motor drive to advance a new section of clean media. When the cloth is fully used, it is discarded and a new 150-yard roll is installed in its place.

Conventional spray booths can be converted to Dispo operation.

Manufacturer: Binks Manufacturing Company, 3118-40 Carroll Ave., Chicago 12, Ill.

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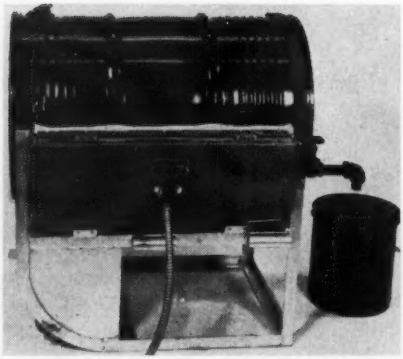
★ ★ ★

Horizontal Drum Warmer

A device for heating drums of heavy or viscous materials in the horizontal position has been introduced by the Harold L. Palmer Company.



Drum Warmer: Viscous Products Flow

Designed especially for applications requiring frequent small-batch draw-off, the compact drum warmer has a

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Consult our staff
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Since 1901
Rhodium electroplate is suggested for these applications: on wave guides and microwave equipment which may be used in marine atmosphere; in printed circuits; in electrical contacts where light contact pressure and low voltages are involved... Rhodium is very hard and corrosion-resistant.
This Rhodium plating solution is easy to use. It operates over a wide range of temperature and current densities. We will be glad to plate samples without charge.
SIGMUND COHN MFG CO., INC. — 121 SOUTH COLUMBUS AVE. MOUNT VERNON, N.Y.

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One of the many tube coaters in use at the A. H. Wirz Co. in Chester, Pa.

COSDEN SQUEEZES FINISHING PROBLEMS OUT OF WIRZ TUBES

A. H. Wirz Company, a major manufacturer of collapsible tubes for everything from toothpaste to thread lubricant, relies on Cosden finishes to meet complex coating requirements. The finishes must be uniform, color-perfect and adaptable to high-speed coating equipment yet capable of maintaining film integrity under severe flexing, twisting and crimping. In certain applications, the coatings have even been required to exhibit additional properties such as non-toxicity, chemical resistance and special electrical characteristics.

Developing multiple-requirement finishes for varying application methods — at a reasonable cost — is not new to Cosden. Thousands of finish requirements have been met effectively and economically. Maybe yours will be next! Send us your requirements today.

COSDEN PAINT COMPANY

BEVERLY NEW JERSEY

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semi-cylindrical heating unit which cradles the drum horizontally.

High-viscosity compounds such as paint, grease, resin, varnish and heavy oil are brought to the desired consistency and maintained ready for use around the clock.

Designed to accomodate standard 55-gallon drums, units are offered in a choice of two thermostatically controlled temperature ranges—60-250 deg. F. and 100-450 deg. F.

Manufacturer: Harold L. Palmer Co., 28625 Grand River Ave., Farmington, Mich.

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Burnishing Compounds

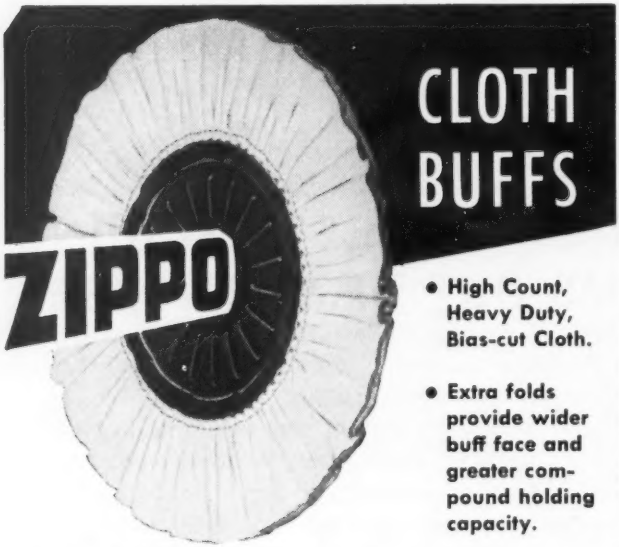
Three barrel finishing compounds have recently been announced by Almco, Queen Products Division, King - Seeley Corporation.

Compound No. 101 is a concentrated powder formulated to burnish aluminum, zinc, stainless steel and other metals. It is useful for burnishing die-cast parts.

Compound No. 101A is a liquid used for metal-cleaning, burnishing, and light degreasing. Recommended for use in spindle machines, submerged barrels, and vibratory finishing machines, it can also be used in metal stamping and cold rolling.

Compound No. 403 is a neutral abrasive compound which can be used with any type of media for cut-down of both

(continued)



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- **Extra folds provide wider buff face and greater compound holding capacity.**
- **Ventilated Steel Centers.**
- **Perfectly balanced sections require no raking.**

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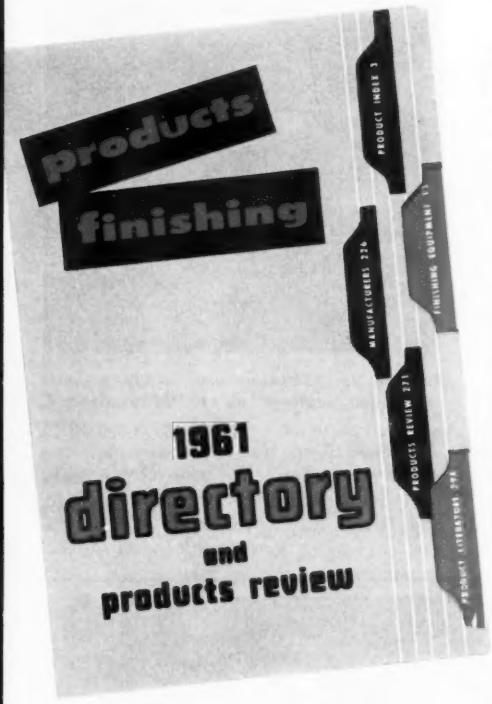

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Products finishing **directory**

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ferrous and non-ferrous metals. An aluminum-oxide base compound, it contains grease and oil emulsifiers, water softeners, rust inhibitors, and abrasive materials. It can be used in self tumbling as well as with all types of barrel finishing media to generate radii, improve finishes and deburr.

Manufacturer: Almco, Queen Products Div., King-Seeley Corp., Albert Lea, Minn.

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★ ★ ★

Aluminum Spray-Paint Resists High Temperatures

Ability to withstand a temperature of 1000 deg. F. for intermittent periods is reported for Sprayon No. 324 High-Heat Aluminum Paint by the maker, Industrial Supply Division, Sprayon Products, Inc.

Sprayon No. 324 Aluminum: self-spray paint resists temperatures up to 1000 deg. F.

Packed in a 16-oz. aerosol can, the paint is specially formulated for high-temperature applications. Sprayon No. 324 Aluminum withstands a tempera-

(continued)

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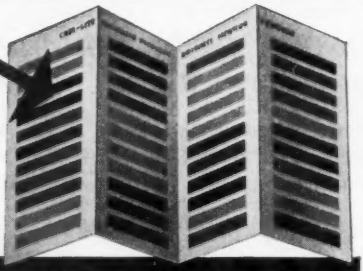

CRESCENT BRONZE POWDER CO.
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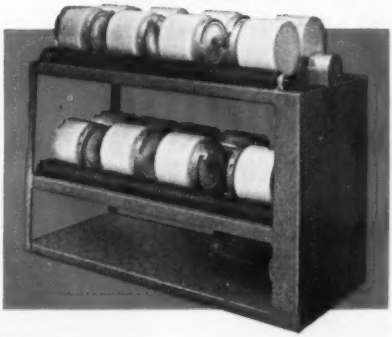
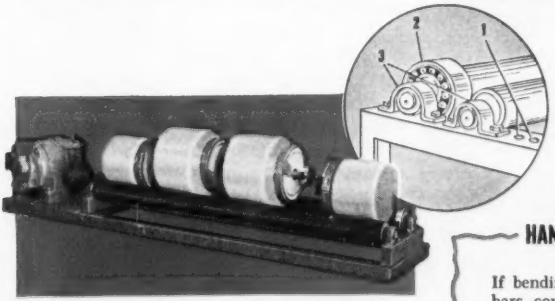
Greater Capacity
Maximum Flexibility
in LIMITED SPACE

"U. S."
LONG-ROLL
JAR MILLS



"U. S." Long-Roll Jar Mills are specially engineered to make most efficient use of valuable floor space. Their greater capacity and flexibility make it possible to expand substantially your milling facilities within virtually the same floor area as occupied by other models.

These units have sturdy welded steel frames built for long, dependable service under rigorous operating conditions. The 3" diameter parallel-ground rollers are made of long-wearing chemical- and solvent-resistant Neoprene rubber. Electrically conductive rubber automatically grounds any static charge generated by jar rotation. Heavy-duty motors and drives assure ample power



Special features:

1. 3-position adjustment handles jars 2" to 15" in diameter.
2. Free-turning, ball bearing jar stops.
3. Lifetime lubricated and sealed bearings.

FULL RANGE OF SIZES

Available with two or three rolls; single or multiple tiers; roll lengths from 16" to 72". Constant or variable speed drives. Wide choice of optional equipment including cabinets, casters, automatic timers, tachometers, clutches and drives.

HANDY HINTS on Jar Milling

If bending or breaking jar lid locking bars constitute a problem, check for hardening of the gaskets. Should be soft enough to indent with fingernail (about 30 Durometer).

For additional helpful grinding and mixing data plus full details on "U. S." Jar Mills WRITE FOR BULLETIN JM-290.

105-P4

PROCESS EQUIPMENT DIVISION

U. S. STONEWARE

AKRON 9, OHIO

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3 guides to better finishing

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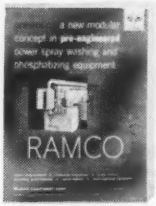

NEW, TWIN-FLOW OVENS. Ramco's newly perfected designs in standard batch, special and conveyorized ovens.

CONTROLLED DEGREASING VAPOR-SPRAY. 2 and 3 stage units to improve quality and increase production.

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RAMCO EQUIPMENT CORP.
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ture of 500 deg. F. indefinitely. Covering fast and economically, it is intended for steam pipes, furnaces, ovens, motors and engines.

Manufacturer: Industrial Supply Div., Sprayon Products, Inc., 2075 East 65th St., Cleveland 3, Ohio.

For more data circle **26** on Postpaid Card

★ ★ ★

Cut-and-Color Buff

Monobuff

The Monobuff, a buff announced by Midwest Buff Company, combines fast-cutting characteristics of a sewed or a bias-type buff and the high-coloring properties of a loose buff.

The patent-applied-for construction employs a double row of wide, overlapping blades. Overlapping blades cut aggressively yet provide soft wiping action, Midwest Buff says.

The buff's free-cutting action minimizes drag, reducing operator fatigue or power drain on automatics.

As the Monobuff wears, more plys appear and the density increases to compensate for loss of peripheral speed. The buff is available in three types: full cloth (64/68, 80/92, or 86/93), cotton pieced, and sisal with cotton covers. Different densities are provided by varying the sewing, number of plys, or number of blades. Available treated for prolonged life and faster cutting.

Manufacturer: Midwest Buff Manufacturing Co., 2515 E. 79th St., Cleveland 4, Ohio.

For more data circle **27** on Postpaid Card

Photo-Resist Stripper for Printed-Circuit Boards

A non-flammable liquid which rapidly removes Kodak Photo Resist (KPR) and other acid resists from printed circuit boards after etching has been developed by Enthone, Inc.

Called Stripper "K", the Enthone product removes most photo resists in less than one minute. Pressure spray rinsing is usually all that is required to remove residual resist after immersion in Stripper "K."

Manufacturer: Enthone, Inc., 442 Elm St., New Haven 8, Conn.

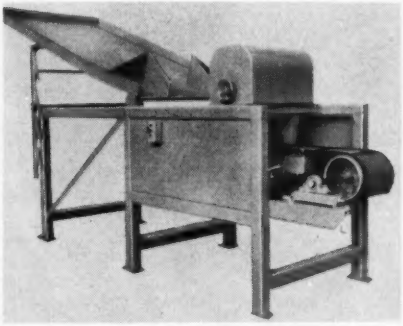
For more data circle **28** on Postpaid Card

★ ★ ★

Magnetic Separator Removes Parts from Tumbling Media

A drum type magnet separates parts from tumbling media in a machine recently introduced by Rampe Manufacturing Co.

Parts are deposited on a moving conveyor belt which carries them to



Rampe magnetic separator with hopper load. Another model is built to be used as an accessory with existing screen separators.

assembly or packing. No hand separation is required.

Manufacturer: Rampe Manufacturing Co., 14915 Woodworth Ave., Cleveland 10, Ohio.

For more data circle **29** on Postpaid Card

Save Masking Time, Costs

Tape with BRADY

PRE-CUT MASKS

Self-Sticking Masks for painting, plating, anodizing operations. Die-cut to close tolerances. Go on *fast*. Any size or shape. Circles up to 6" diameter in stock.

Also precision-slit tape in rolls for fineline masking. Widths from 1/64" to 3/8"—30 yard rolls.

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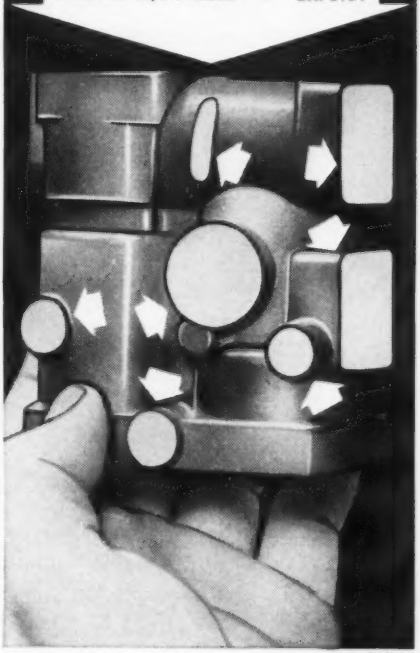


108A

For more data circle 387 on Postpaid Card

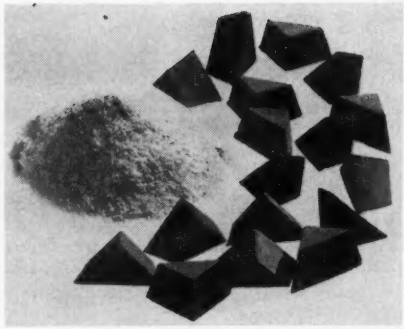
Burnishing Compound Improves Color of Zinc Die Castings

A burnishing compound that's said to improve color in barrel finishing zinc die castings has been announced by Minnesota Mining and Manufacturing Co.

The free-flowing soap-type compound also improves color of steel and most alloys, 3M reports.

The product is "Honite" brand One-Twenty-Six finishing compound. It and a tumbling shape announced in 1959 were developed to solve problems encountered in finishing zinc die castings. The lightweight chips, which will not gouge the soft metal, are "Honite" brand "Z-N" tumbling shapes.

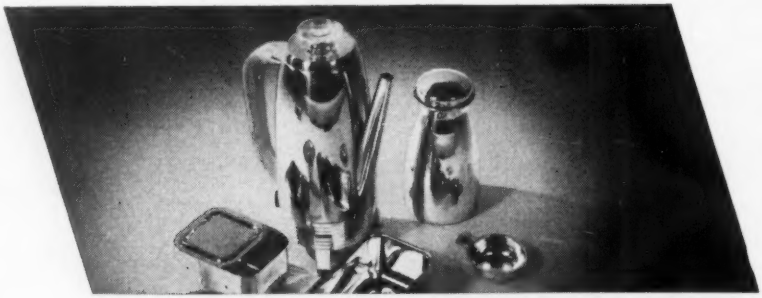
Frequently a relatively small amount of the compound can be used in the cutdown cycle; then without rinsing the load, more compound can be added for the burnishing cycle, 3M said. That saves one step in barrel finishing and lowers compound costs.



"Honite" brand One-Twenty-Six finishing compound has been announced by Minnesota Mining and Manufacturing Co. especially for use with "Honite" brand "Z-N" tumbling shapes in barrel finishing zinc die castings.

Manufacturer: Minnesota Mining and Manufacturing Co., 900 Bush Ave., St. Paul 6, Minn.

For more data circle **30** on Postpaid Card



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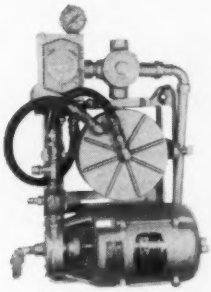
Here's How HOT SPRAY Cuts Finishing Rejects . . . Gives Superior Finish, in Less Time, at Lower Cost!

More and more HOT SPRAY users are finding that Spee-Flo systems offer many advantages over other equipment.

Spee-Flo Hot Spray units maintain a constant and uniform temperature **at the gun,** even in intermittent service. As a result, there is no variation in material viscosity — no need to add additional thinners which reduce finish quality — you save time and material, enjoy greater coverage and longer film life.

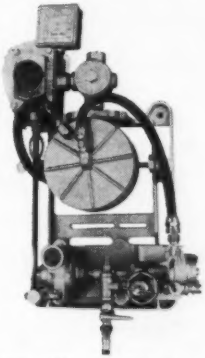


MODEL 300 APE CIRCAFLO CIRCULATING HEATER OPERATES FROM CONVENTIONAL PRESSURE TANK.

Efficiency? Check these Spee-Flo features . . .

- **Lower finishing cost per unit**
- **Improved build and holdout**
- **Stops blushing, orange peel and sag**
- **One coat application**
- **Greater coverage**
- **Faster, all-weather spraying**
- **Material saving with reduced overspray**

Call your nearest Spee-Flo distributor or write to Spee-Flo Company, 6614 Harrisburg, Houston 11, Texas, for the booklet, "Why Hot Spray?"



MODEL 300 AR ROTOFLO CIRCULATING HEATER SIPHONS MATERIAL DIRECTLY FROM THE ORIGINAL CONTAINER.

Ask for an on-the-job demonstration!

6614 Harrisburg, Houston 11, Texas

The SPEE-FLO Company

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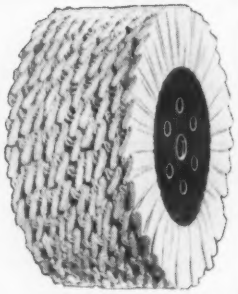
CHURCHILL Finger-Buff*

#302



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- **Rugged**
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The Outstanding Cloth Buff for:

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Fast cut on all metals

Superior performance on all surfaces.

**Churchill Finger-Buff, T.M. Reg. U.S. Pat. Off.*

REPRESENTATIVES IN PRINCIPAL CITIES

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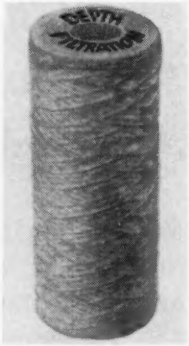
Dept. PF-21, Hingham, Mass.

For more data circle 391 on Postpaid Card

Low-Cost Viscose Filter Tubes

Economical replacement filter-elements made of viscose are suitable for filtering mild acid and alkaline solutions (pH 3-11). They supplement but do not replace tubes of cotton, Dynel, porous stone and porous carbon, each of which is useful for certain applications.



Viscose Filter Tube

The recently introduced tubes are available with perforated steel, stainless steel, or perforated polypropylene cores and in Sethco No. 5 and No. 10 sizes. Densities for removing particles down to 10 microns.

Manufacturer: Sethco Mfg. Corp., 2284 Babylon Turnpike, Merrick, L. I., New York.

For more data circle **31** on Postpaid Card

★ ★ ★

Chromium Plating Solutions with Built-In Fume Control

Unichrome SRHS chromium plating compounds now contain a chemical fume suppressor in addition to the chromic acid and plating catalyst. No addition agents are required under normal operating conditions.

Where tank ventilation is exceptionally poor or where drag-out is excessive, occasional addition of Fumetrol, a fume suppressor, may be necessary.

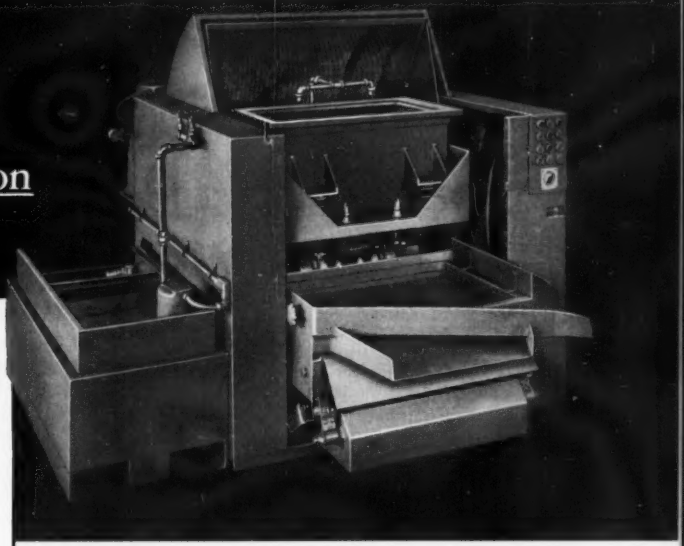
The recently introduced products are available for use in decorative and ultilitarian chromium plating. Existing baths may be converted easily.

Manufacturer: Metal & Thermit Corporation, Rahway, N. J.

For more data circle **32** on Postpaid Card

announcing the NEW *Recirculating VIBRATRON

See the difference Recirculation makes!



Processed in *Recirculating* Vibratron. Gleaming! Clean!

Processed in conventional vibratory machine. Notice abrasive impregnation.

This new idea in vibratory finishing pays off in increased production and operating economy. Wastes are removed constantly during the processing cycle, *eliminating* abrasive impregnation! Compound stays clean.

Parts may be deburred, radiused, and cleaned *in one operation*. No separate cleaning cycle needed! Equally important . . . compound can be used for its effective life, lasts up to 48 hours.

The result? The unretouched parts photo tells the story. Both were vibratory finished the same time in the same media. The top in a recirculating Vibratron. The bottom in a conventional vibratory machine.

Want to know more? Your inquiry will receive prompt attention. Let's hear from you. Today?

ROTO FINISH

ROTO-FINISH / RANSOHOFF

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***U.S. and foreign patents applied for.*

FOREIGN REPRESENTATIVES: ARGENTINA-Roto-Finish Argentina-Buenos Aires • AUSTRALIA-A. Flavell Ltd.-Cheltenham • BRAZIL-Refema-Roto-Finish-Sao Paulo • CANADA-Canadian Hanson & Van Winkle Co., Ltd.-Toronto • ENGLAND-Roto-Finish Ltd.-Hemel Hempstead • FRANCE-Societe Roto-Finish-Paris • GERMANY, AUSTRIA, FINLAND, NORWAY, SWEDEN, SWITZERLAND, YUGOSLAVIA, JAPAN-Metallgesellschaft A.G.-Frankfurt, a.m.-Germany • HOLLAND, BELGIUM, LUXEMBURG-N.V. Roto-Finish Maatschappij-Delft, Holland • ITALY-Societa Roto-Finish a R.L.-Milan • MEXICO-Enthone de Mexico, S.A. Prol Pina 669, Mexico 15, D.F. • SPAIN-Instituto Electroquimico, S.A.-Barcelona

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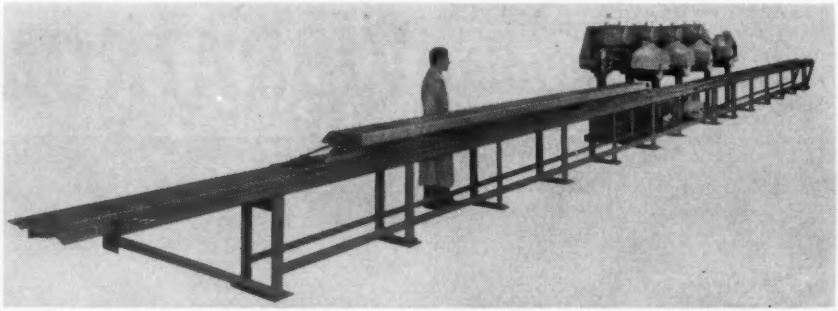

Acme automatic, reciprocating, straight-line buffing machine for finishing long extrusions.

Automatic Buffing Machine: For Finishing Long Extrusions

An automatic, reciprocating straight-line buffing machine for finishing long extrusions is available from Acme Manufacturing Co.

The machine consists of a conveyor on which a reciprocating, work-holding platen is mounted and a series of adjustable buffing lathes.

The reciprocating platen is actuated by a motor-driven worm gear and rack and pinion arrangement. The platen has an adjustable stroke mechanism actuated by a reversing controller and two limit switches.

In a typical application extrusions are manually loaded and clamped on the platen of the machine. At the start of the cycle the buffing wheels automatically drop into position and the extrusions are carried under the buffing heads. As the extrusions approach the first buffing head a limit switch is tripped, which starts an automatic buffing-compound applicator. After the extrusions have passed the last buffing head, a limit switch is tripped which reverses the direction of the platen.

On the return stroke of the platen the buffing wheels rotate in the same direction as the movement of the extrusions to "color" the surface. At the end of the return stroke the platen automatically stops and the extrusions are turned for additional buffing operations until all sides are finished.

Manufacturer: Acme Mfg. Co., 1400 E. 9 Mile Rd., Ferndale 20, Mich.

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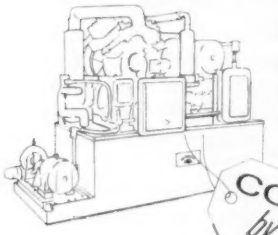
MF/301

For Anodizing (Regular and Hard Coat) and Plating Processes . . . You Need the

New MAYER PACKAGED ACID CHILLER



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Bulletins on Request

MAYER REFRIGERATING ENGINEERS, INC.

LINCOLN PARK, NEW JERSEY • OXbow 4-7100

For more data circle 393 on Postpaid Card

"...easy Joe, that baby's worth a quarter million!"

NEW DESPATCH OVEN DRIES TRANSFORMERS SAFELY, ECONOMICALLY

When products are worth $250,000 apiece, processing mistakes can be costly.

That's why Wagner Electric Co., St. Louis, called on Despatch for a moisture removal oven.

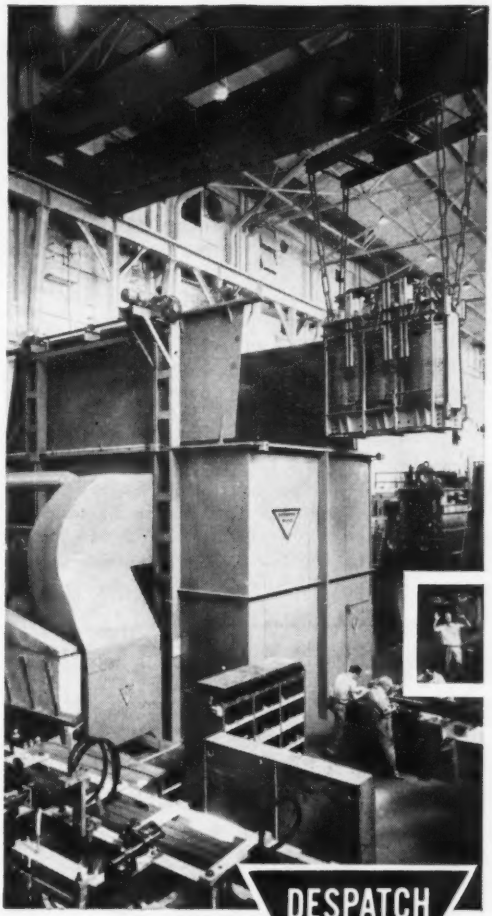
This new Despatch oven performs exactly according to specification. It also increases productive capacity and makes operations more versatile.

Drying Wagner's giant transformers—which range up to 100,000 kva—is a vital and critical step. Moisture must be removed, but heat must not damage insulation.

"We considered many other types," reports company official Charles Ruder, "but Despatch proved to be up to twice as economical."

Perhaps your firm has a similar problem. Our engineers will be pleased to discuss it with you . . . or any other in industrial heating, metal washing, spraying, etc. There's no obligation.

Write today for free bulletin 100FG.



DESPATCH OVEN CO.

DESPATCH—INDUSTRY LEADERS FOR 58 YEARS

For more data circle 394 on Postpaid Card

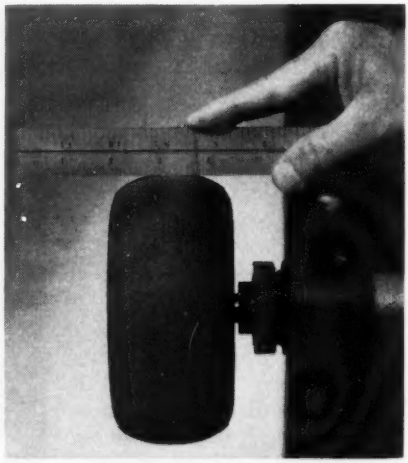
Self-Crowning Abrasive Bands Grind Contours

Coated abrasive bands and belts which assume any desired degree of crown when run on inflatable rubber drums have been developed by Behr-Manning Co.

Suited for both stock removal and polishing, these bands are recommended for offhand work in confined areas, and particularly on concave or other contoured surfaces. Their crowned shape eliminates the edge cutting that occurs when a flat band is inadvertently tilted, permits accurate grinding on extremely narrow areas, and diminishes chattering when operated at low pressures.

They are made of aluminum oxide abrasive in grits 40 through 180 on X-weight cloth, bonded with all-resin adhesives; they are designed for use on smooth-faced or serrated "Valcore" drums made by Nu-Matic Grinders Inc. of Cleveland. Application for patent protection on the abrasive products has been made.

Here a coated abrasive "Kontoor" band is crowned only slightly, but enough to prevent edge-cutting as a pneumatic grinder brings up a finish on a conical stainless steel vessel for use in food processing.



A straight-edge shows the degree of crown which can be developed in the coated abrasive "Kontoor" bands when run on an inflated drum.

Bias-cut but not molded, the bands assume a crowned shape when the pneumatic wheel or drum is inflated.

These bands will not take an exact shape; instead, their degree of crown will depend on grit size, air pressure

(continued)

MAGNETS?

CALL **PERMAG**

in N.Y. **OLYMPIA 7-1818**
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IN L.A. **WEBSTER 6-6251**
(TWX: LA-2086)

All sizes, shapes, grades in stock... Alnico and ceramic ...sintered, cast. Engineering, grinding, cutting, magnetizing. 24-hour delivery. Write for catalog.

PERMAG CORP.
88-06 VAN WYCK EXPRESSWAY
JAMAICA 18, NEW YORK

PERMAG PACIFIC CORP.
2910 S. LA CIENEGA BLVD.
CULVER CITY, CALIF.

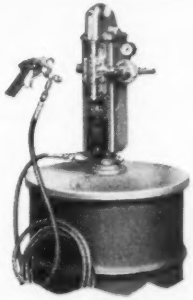
For more data circle 395 on Postpaid Card

NEW!
Utility model airless spray unit

Lincoln's "No-Air" Dyna-Spray System cuts cost in applying paints and other industrial finishes. No atomizing air or material heating is needed. The paint is supplied direct from a 5- or 55-gallon container by Lincoln's Power-Master pump. The Dyna-Spray gun lays an even coating, reduces overspray and bounce-back, and frequently eliminates the need for a second coat. This simple, trouble-free airless hydraulic unit (Model MD-81, illustrated at right) costs less than $500.

Send the coupon for Dyna-Spray Bulletin 404R today.

Model 1721 Portable Dyna-Spray System has 5-gallon reservoir.



Model MD-80 Heavy Duty Dyna-Spray System fits 55-gallon refinery drum.

LINCOLN ENGINEERING CO.
4010 Goodfellow Blvd., Dept. PF-1
St. Louis 20, Mo.

Please send Dyna-Spray Bulletin 404R.

NAME

TITLE

COMPANY

STREET

CITY ZONE STATE

I 6102

LINCOLN
ENGINEERING COMPANY

ST. LOUIS 20, MO. • DIVISION OF McNEIL MACHINE & ENGINEERING CO.

For more data circle 396 on Postpaid Card

in the drum, the drum speed and the pressure exerted on the work. For best results, the grinding station should be equipped with an air outlet complete with pressure reducer, air hose and a nozzle-type air gun for inflating the drum.

Manufacturer: Behr-Manning Co., a division of Norton Co., Troy, N. Y.
For more data circle **34** on Postpaid Card

★ ★ ★

Thin Gloves Provide Finger Dexterity

Pioneer Rubber Co. has introduced its "Nimble-Fingers" gloves in larger sizes. These gloves are tissue thin, made of Pylox, and are designed for jobs requiring extreme finger sensitivity and hand dexterity.

Thin, Large Gloves

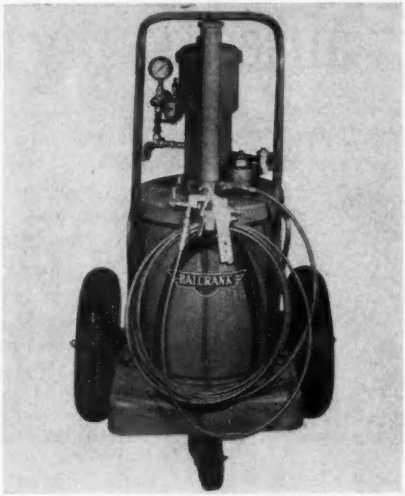
These gloves are resistant to acids, alkalies, oils, greases and some solvents. With the addition of the larger sizes, these gloves are available for any hand—from small women's sizes to extra large men's sizes.

Manufacturer: Pioneer Rubber Co., 296 Tiffin Rd., Willard, Ohio.
For more data circle **35** on Postpaid Card

★ ★ ★

Airless Spray Equipment

Equipment recently introduced by Balcrank, Inc., is designed for airless spray application of water and oil-base paints. Unit is said to make possible faster painting, material savings.



Balcrank Airless Spray Painting Equipment

Manufacturer: Balcrank, Inc., Cincinnati 9, Ohio.
For more data circle **36** on Postpaid Card

YOUNG BROTHERS *Baking and Drying* **OVENS**

designed and built for every product and process requirement

Batch and Conveyor types up to 1000° F.

Write for Bulletin 157

YOUNG BROTHERS CO. 1830 Columbus Road Cleveland 13, Ohio

Over 60 years of service

ESTABLISHED 1895 YB CO

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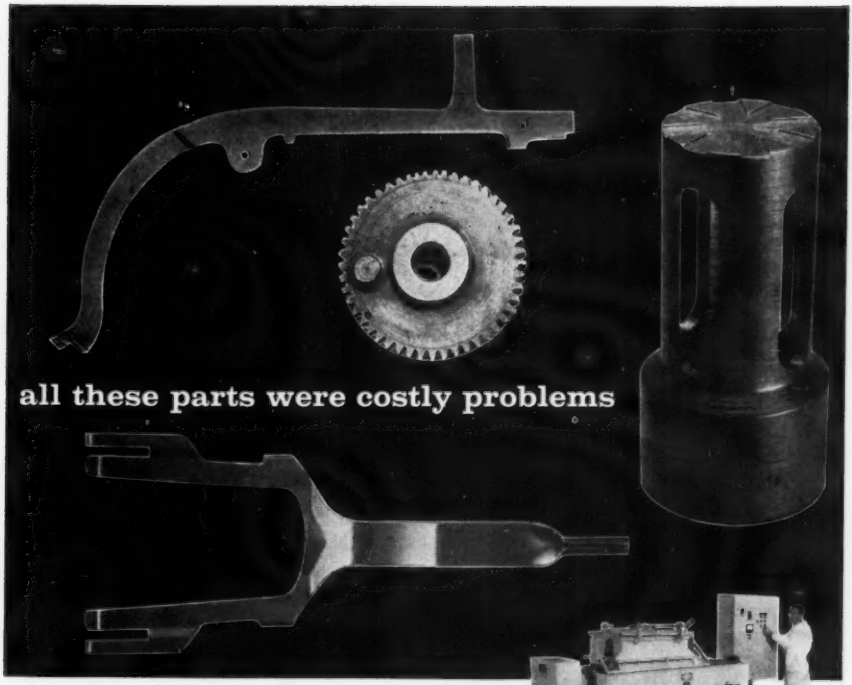
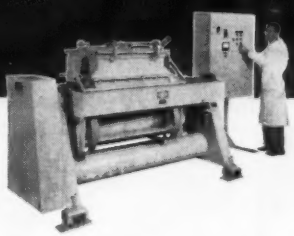


SOLVED by LORCO® vibratory finishing

You can make substantial savings in time and cost of your precision finishing operations—as over 100 other firms have done—with LORCO vibratory finishing equipment.

LORCO vibratory machines will do any finishing operations now being performed in tumbling barrels, of course, in far less time and with invariably superior results. But most important, LORCO equipment can successfully finish parts that can not be done by any other mechanical means. All of the representative parts shown above were costly problems because of their size, shape, fragility, location of burrs, or finishing requirements. All are being finished successfully in Lorco vibratory equipment, with time and cost savings up to 90%.

Parts that are too fragile to tumble—parts having shielded, recessed, or inaccessible burrs—parts requiring the closest precision finishing tolerances can be LORCO Vibrator finished as readily as coarse work requiring severe cut-down.



There's a LORCO vibratory finishing machine for every requirement of production volume and size of parts. Six machine sizes, from ¼ cu. ft. to 16 cu. ft. capacity. Model 1930, illustrated, has 6 cu. ft. load capacity, many exclusive design and operating features.

Our vibratory finishing laboratory stands ready to prove the savings you can make on your toughest finishing problems, with Vibratory finishing. See your Lorco representative or write to Lord Chemical Corp., 2068-E So. Queen St., York, Pa.

LORD CHEMICAL CORP.

a majority-owned subsidiary of

WHEELABRATOR CORPORATION

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Tumbling Machines

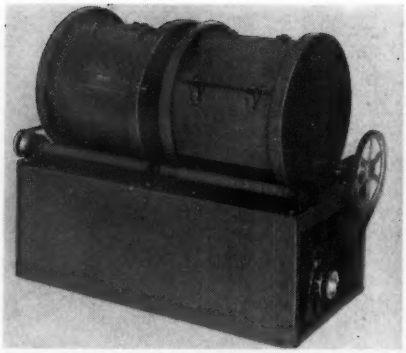
Two economical tumbling machines have been introduced by Delta Manufacturing Co.

Both machines consist of power-driven rollers which rotate self-contained tumbling barrels. The tumbling barrels are cradled by the power-driven rollers during tumbling.

Model 500 has a single tumbling barrel 8 inches long and 9 inches in diameter. This barrel holds 1¾ gallons.

Model 200 has two barrels, each of which holds one cubic foot and is 12 inches long and 12 inches in diameter.

All barrels are lined with polyvinyl chloride plastic. Both models are driven by ¼-h.p., 1725-r.p.m. motors. Variable-speed pulleys make possible barrel-speed changes. 25-45-r.p.m.



Delta Model 200 barrel finishing machine

Delta recommends these units for polishing, burnishing, roughing and deflashing.

Manufacturer: Delta Manufacturing Co., 1137 W. Hilton, Phoenix, Arizona.

For more data circle **37** on Postpaid Card

★ ★ ★

High-Solids Vinyl

Amercoat 99 provides excellent protection from corrosion in industrial and marine atmospheres when applied by conventional or airless-spray painting methods, the developer reports.

One cross-sprayed coat applied with airless spray equipment yields a dry-film thickness of more than five mils. Two coats with conventional spray equipment produce the same five-mil coating.

The coating barely sags at a wet-film thickness of 25 mils.

The recently introduced coating is recommended for ship's hulls, structural steel.

It dries to a hard, matte finish which adheres firmly and resists abrasion.

Manufacturer: Amercoat Corp., South Gate, Calif.

For more data circle **38** on Postpaid Card

SPRAY MASKS
REDUCE YOUR MASKING COSTS BY USING INEXPENSIVE, HEAT RESISTANT
KWIKY-DOTS
A raised edge is automatically provided on each disc for easy grasping. Connected strings of several discs may be removed for fast application. Stock Size: ⅛" up.
NARROW MASKING TAPES
Precision cut to any size from 1/32" up. In standard 60 yd. rolls.
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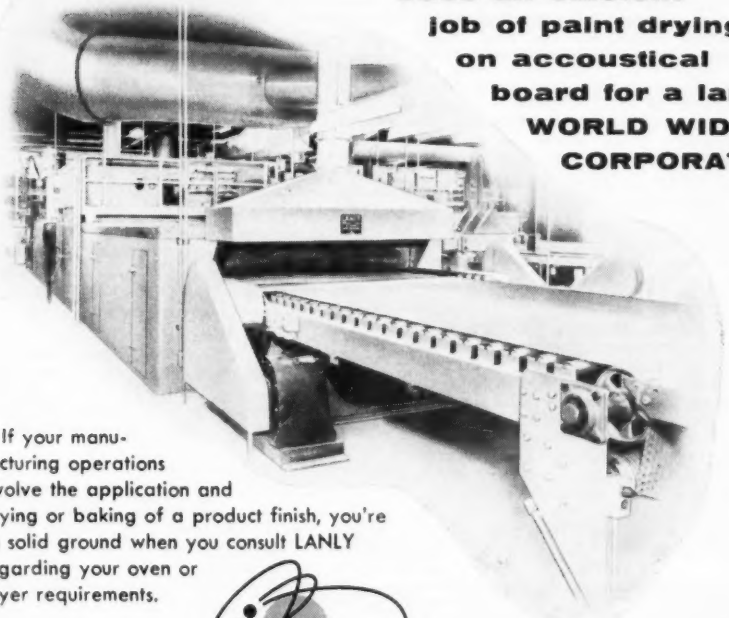
This Lanly Conveyorized Lay-Down-Dryer

does an efficient job of paint drying on accoustical board for a large WORLD WIDE CORPORATION



If your manufacturing operations involve the application and drying or baking of a product finish, you're on solid ground when you consult LANLY regarding your oven or dryer requirements.

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Pittsburgh, Pa. • Rochester, N. Y. • San Francisco, Calif. • St. Louis, Mo.

For more data circle 324 on Postpaid Card

Free Literature

(Circle numbers on postpaid card opposite page 136 to obtain free literature)

Polishing, Buffing, Degreasing, Cleaning, Barrel Finishing, Plating, Anodizing, Phosphatizing, Baking, Vacuum Metallizing, Chromate Coating, Paint Finishing, Waste Treatment.

45. Special-Purpose Industrial Clothing
1961 Catalog describes static-free, lint-free clothing for men and women; chemical-resistant fabrics; lab coats and work dresses; other industrial clothing. Tells how to save money on work clothing. Worklon, Inc.

46. Hard Finish in 5-10 Minutes
Information on Agateen Ponetic No. 1, a new product that bakes to a hard organic finish in 5-10 minutes at 300 deg. F. Agate Lacquer Mfg. Co., Inc.

47. Chromium Chemicals
Bulletin 52 contains technical information on chromic acid and other products. Solvay Process Div., Allied Chemical Corporation.

48. Cold Stripper
Technical sheets describe Electro Cold Stripper, a non-flammable liquid paint remover that will strip air-dry and high-bake synthetic coatings, alkyds, epoxies, vinyls, phenolics and so on. This product is useful in removing specialized coatings such as photo resists, vacuum plated coatings and is also used in conjunction with ultrasonic cleaning operations. Available in liquid form for dipping operations or in viscous form for brush application or flow on. Allied Finishing Specialties Co.

49. Plating Brighteners
Data file on the company's line of "chemically different" plating brighteners. Allied Research Products, Inc.

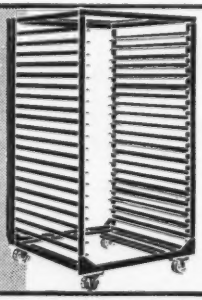
50. Conveyor Chain
Bulletin illustrates and describes Alvey-Ferguson engineered Conveyor Chain, contains dimensional prints of various sizes of special chain, includes installation photographs showing its use as slat conveyors, pusher-bar boosters and as side chains for open types of belting in metal cleaning and processing machines. The Alvey-Ferguson Co.

51. Baking and Drying Ovens
Bulletin 157 describes line of batch and conveyor-type baking ovens for heating up to 1,000 deg. F. Young Brothers Co.

52. Racks for Anodizing and Electropolishing
Catalog describes all-titanium and aluminum racks. Pin racks, disc-racks, box-type systems, standard utility racks. Includes discussion of "why titanium racks cost less to use." Servi-Sure Manufacturing Co.

53. Finned Plastic Plating Barrels
Information on finned-plastic plating barrels that are designed to agitate the plating bath and speed circulation of the solution. Imperial Industries, Inc.

FOR INCREASED PRODUCTION
and
GREATER OVEN CAPACITY
use WILDER
RACK TRUCKS
No. 660



27 Standard Style and 150 Standard Size platform, shelf, tray, rack, stake, bin, box and table trucks to select from. Special sizes can be furnished.

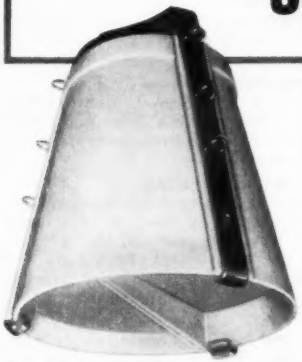
Write for Complete Information on Wilder's Full Line of Production Handling Equipment.

WILDER
MFG. CO., INC.
Port Jervis, New York

For more data circle 400 on Postpaid Card

TO GET PEAK PERFORMANCE, SPECIFY

STEVALITE BARRELS



Here's Why Stevens Can Offer You a Barrel superior to anything else on the market today:

THE MATERIAL

Stevalite . . . tremendous impact strength . . . heat resistance to 270° F. 50% lighter than any other material.

THE DESIGN

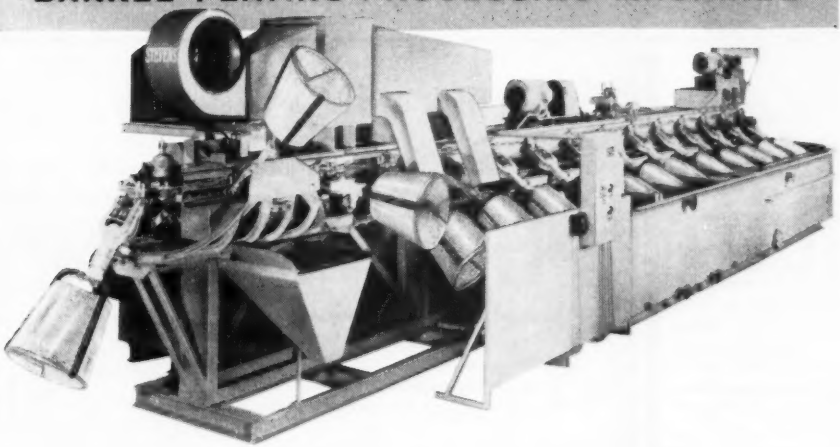
Oblique barrel tumbles parts more effectively giving improved plate distribution. Thinner wall decreases solution dragout. Dense perforation count boosts current draw and plating speed up to 30%. Faster drying.

THE CONSTRUCTION

Rigid, rugged *all welded* . . . unaffected by heat distortion . . . reinforced to resist damage. Minimum number of necessary parts.

You cannot buy a more efficient and productive barrel anywhere. Simple in conception and construction, it can guarantee you real maintenance-free performance and long productive life . . . the perfect barrel.

FOR USE ON ALL STEVENS AUTOMATIC BARREL PLATING-PROCESSING MACHINES



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***Remember*—When you go *automatic* . . . go STEVENS!**

For more data circle 401 on Postpaid Card

54. Longer Life for Aluminum Siding
Information on an acrylic coating that's specially formulated to provide long life on aluminum siding. Pittsburgh Plate Glass Co., Industrial Finishes Div.

55. Fast-Dry Alkyd
Information on Aroplaz 6006, a fast-air-dry alkyd resin which is used in paints that set up tack free in six minutes, yet retain performance advantages of alkyds. High solids content allows one-mil-thick film to be applied in just two passes of a spray gun. Archer-Daniels-Midland Co., Resin Div.

56. Epoxy Resin Powders for Fluidized Bed Process
Description of E Series powders, which are specially made for applying coatings by the fluidized bed process. Includes list of applications, details on fluidized-bed process and equipment. Armstrong Products Company.

57. Buffing Compound
Information on Atlantic greaseless compounds with K-134, a recently developed additive that is said to reduce application time, make the compound adhere to buffing wheels, cut waste. Atlantic Compound Co.

58. Materials-Handling Trucks
Catalog describes line of all-purpose materials-handling trucks. 27 standard styles, 150 different platform, shelf, tray, rack, stake, bin, box and table trucks. Wilder Mfg. Co., Inc.

59. Demineralizers
New Demineralizer Catalog 160 describes Barnstead's complete line. Barnstead Still and Sterilizer Co.

60. Degreaser Lid
Information on the Baron Econ-O-Lid, a roll-type cover which fits all vapor degreasers, is easy to roll open or shut. Baron Industries.

61. Belt Finishing Materials
Selection of offhand belt finishing materials is simplified by means of a wall chart that lists proper abrasives, grit size and type, belt speed, lubricant and contact wheel for 16 of the most popular metals and alloys. Behr-Manning Co., Dept. PF-2.

62. Plastic and Rubber Coatings
Leaflet shows typical applications for Belke rubber and plastic coatings. These coatings are useful in protecting formed wire products, tool handles, chains, conveyor hooks, tote baskets, many other products. Belke Manufacturing Co.

for the "Solution to your Plating Problems" .... come to

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new **Hi-Speed** *bright copper plating* ... right out of the barrel!

BARREL COPPER Brightener . . . *can be used in your present regular solution with standard equipment*

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- COP-BRITE
- BARREL COPPER Brightener
- BARREL NICKEL Brightener

- *The only ONE brightener required —cuts operating costs*
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A Proven Process!
Used successfully by job platers and manufacturers
Non-Critical
Boosts Production
Cuts Rejects

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Now . . . pull the fan wheel or motor while DeBothezat® Bifurcator® Fan remains in duct.

Not just an access door. Half the entire cone comes off.

Speed up inspection . . . slash maintenance and downtime costs.

This removable cone design is an exclusive feature found only on DeBothezat Bifurcator Fans.

Published ratings on DeBothezat Fans tell you exactly what the complete fan unit puts out. No guess work — no allowance to be on safe side!

New design duct fan

De Bothezat FANS

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American Machine and Metals, Inc.
East Moline, Illinois

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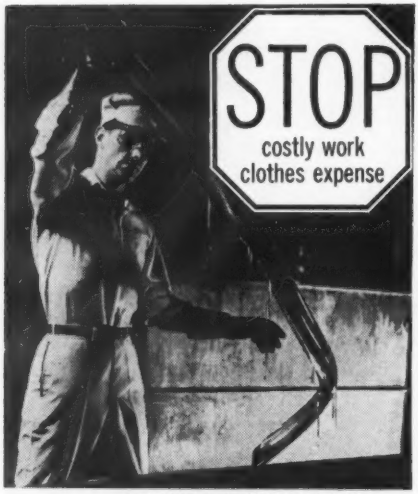

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63. Chromic Acid
Information on BFC chromic acid. Better Finishes & Coatings, Inc.

64. Stable Degreasing Solvent
Information on Blacosolv trichlorethylene degreasing solvent, which incorporates entirely new stabilizers that prevent breakdown and acid formation. G. S. Blakeslee & Co.

65. Tack Cloth
Literature on treated cloths that pick up dust and lint prior to paint finishing. Bond Chemical Products Co.

66. Pre-Cut Protective Masks
Bulletin No. 160-C describes and illustrates Brady self-sticking pre-cut protective masks, tells how to reduce masking costs. W. H. Brady Co.

67. Ultrasonic Cleaning Equipment
Data sheet tells about Sonogen Type TH Transducerized Tanks. These tanks have strip heaters and transducer elements welded externally to the sides and bottoms of the tanks. Insides are smooth. Branson Instruments, Inc., Ultrasonic Power Div.

68. Metal-Processing Products
A six-page folder describes the products made by Bruce Products Corporation: buffing compounds, drawing compounds, cutting oils, non-rust oils, spray booth coatings, cleaners, polishing wheels, die-cut release agents. Bruce Products Corp.

69. Gas-Fired Infrared Burner
A 4-page data sheet contains application data and performance curves for evaluation, selection and specification. This infrared burner was designed for low-temperature applications such as baking paint and drying metals. Bryant Industrial Products Co.

70. Filter on a Cart
Data sheet on the Model 500 Filter, a self-contained unit mounted on a two-wheel cart for easy moving from tank to tank. L. H. Butcher Co.

71. Masking Parts Before Plating, Painting
M-24 Masking Brochure. Six pages. Time-saving hints for masking parts before plating or painting. Data on discs for anodized surfaces, heavy cardboard masks for flush masking, tapered and self-threading plugs, very narrow masking tape, other products. By-Buk Co.

72. Horizontal Barrel Finishing Machines
Bulletin 100 describes and illustrates Burr-Rite Senior Barrel Finishing Machines. Capacities of 5.7 to 38.5 cubic feet; neoprene or rubber-lined steel; compartmented machines. Advantages, construction features and specifications. Casalbi Co.

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73. Paint Remover
Information on Kwik methylene chloride cold stripper. Removes all finishes quickly and safely, including tough synthetics. Will not attack any metal. Chemical Products Co., Inc.

74. Tumbling Small Parts
A 4-page folder on the Handee Slide Abrader, a machine for finishing small parts. Bulletin S-90 gives complete description and illustrations. Portable. Barrel lifts off easily. Chicago Wheel & Mfg. Co.

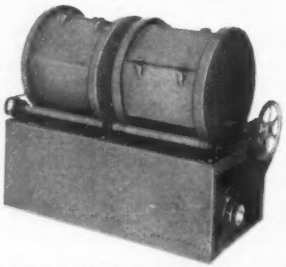
75. Buffs
Data sheet describes Buff Type No. 20-RD, a heavy-duty buff made of sisal twine, used for finishing stainless steel, brass and other metals. Geo. R. Churchill Co., Inc., Dept. PF.

76. Cleaning and Finishing Machinery
A two-page bulletin describes machines, systems and processes for cleaning and finishing metal products. Cincinnati Cleaning & Finishing Machinery Co.

77. Rhodium Plating Instructions
Handy pocket-sized booklet gives complete instructions for rhodium plating, includes data on solution preparation, work preparation, temperatures and current densities, tanks, anodes, and so on. Sigmund Cohn Mfg. Co., Inc.

SAVE 70% ON LABOR
DEBURR • BURNISH • POLISH

MODEL "200" TUMBLER
$275.00
F.O.B. Phoenix



2 LINED HEXAGONAL BARRELS
Processes a Total Volume of 2 Cubic Feet
SPECIFICATIONS: Barrels — Size — 12" x 12" heavy gauge steel, water-tight. Lining — No-Seam Poly-Vinyl.

THE "500" TUMBLER
NOT SHOWN
Barrel Size — 8" long, 9" in diameter. Lining — No-Seam Baked Poly-Vinyl.
$85.58
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1137 W. HILTON PHOENIX, ARIZONA

For more data circle 406 on Postpaid Card

78. Anodizing Racks
Information on Continental Ti-Core racks, which have splines of aluminum for better electrical conductivity, clad with titanium for resistance to corrosive anodizing solutions. Continental Rack Co., Inc.

79. Radiant Heaters
A new 16-page bulletin gives complete information about both Vycor and Pyrex radiant heaters, how they work, design and installation details, and specifications. Plant Equipment Sales Dept., Corning Glass Works.

80. Roller Coating Finishes
Data on vinyl coatings and enamels for roller-coat application. Cosden Paint Co.

81. Alkaline Deruster
Information on Rustnix, a dustless solid cake that rapidly dissolves to make a solution which protects the base metal, eliminates smut. Cowles Chemical Co.

82. Bronze Powders
New color card shows 44 brilliant metallic bronze powders. Golds, coppers, aluminums, grays, browns and pastels. Includes complete directions for use and application. Crescent Bronze Powder Co.

83. Design Data for Lateral Tank Ventilation
Bulletin dt-7 contains 37 pages of useful information on processes and equipment for removing fumes from tanks used in acid pickling, alkaline cleaning, electroplating, dipping and hot rinsing. Includes tables for use in selecting the proper bifurcator; discussion of ventilating problems; diagrams of various types of exhaust and duct systems; descriptions and illustrations of company's line of fans and ventilators. DeBothezat Fans Div., American Machine and Metals, Inc., Dept. PF.

84. Nozzles for Power-Spray Washers
Bulletin 100 tells how to get up to five times more nozzle life in power spray washers, how to get better finishes, which nozzle to use for each job, how to clean nozzles for better jobs. Delavan Mfg. Co.

85. Barrel Roller
Information on motor-driven rolls which power detachable tumbling barrels. Barrels are cradled by the rotating rollers during the tumbling cycle. Delta Mfg. Company.

86. Finishing Systems
Booklet describes and illustrates finishing systems and components: washers, dry-off ovens, spray booths, flow coaters, dip tanks, conveyors, baking ovens. Includes sections on company's line of heat-treat and lab ovens. Despatch Oven Company.

You get response to temperature changes of ±½° F. with Sarco Electric Indicating Controls.
Set the temperature control by turning one knob . . . and read *both actual and set* temperatures on one large dial. You get response to temperature changes of ±½° F. These features—plus reliable performance with negligible maintenance—add up to substantial production economies: controlled plating quality with fewer rejects. Call your Sarco sales representative, or write for details on Sarco LSI Electric Temperature Controllers.

Superior Plating Company, Fairfield, Connecticut, holds the temperature of its chrome plating solution to ±2° F., automatically, with Sarco electric indicating temperature controls

How Superior Plating Company controls critical temperatures in Chrome-Plating Tanks with Sarco Electric Indicating Regulators

In its modern plant at Fairfield, Conn., the Superior Plating Company produces its famous TIBON hard chrome plated ways for machine tools and other TIBON precision plated parts. Working to tolerances less than .0005", to produce the most accurate plating in the industry, solution temperatures are absolutely critical. That's why Superior controls the temperature of the plating solution to ±2° F. over a range of 90° F.—140° F. with Sarco electric indicating controls. Vinyl-coated bulbs are used for longer life. Sarco electric indicating regulators have been controlling Superior plating temperatures for over two years—with complete dependability. 9776F

SARCO
COMPANY, INC.

635 Madison Ave., New York 22, N. Y.

For more data circle 407 on Postpaid Card

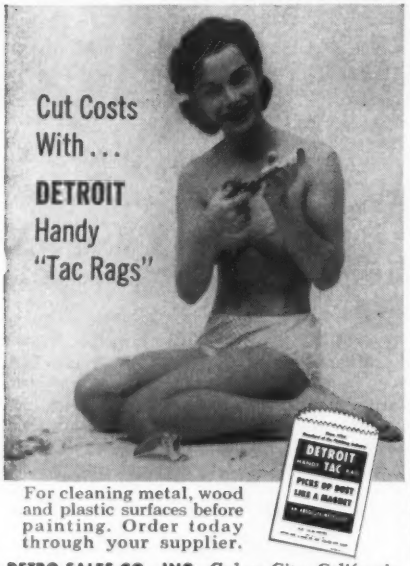
87. Paint-Bonding Process
Data sheet describes Detrex Paintbond Process. Using newly developed Detrex 79B, a water-soluble spray-type phosphatizing compound which makes it easy to control coating weight, it operates with 40 per cent less material cost, produces a finer, tighter coating. Detrex Chemical Industries, Inc.

88. Tack Rags
Four-page folder describes advantages of Detroit Handy Tac Rags. Detro Sales Co., Inc.

89. Spray Guns
Catalog I-2000-a describes manual, automatic and special-purpose spray guns and accessories. 16 pages. Complete information, photos, specifications for entire line of guns. DeVilbiss Co.

90. Plastic-Coating Process, Solventless
Six-page bulletin describes Miccron process for application of plastic resins as protective coatings, using the fluidized bed method. Michigan Chrome and Chemical Company.

91. Safety Device for Ovens
Bulletin C-12, a four-page folder on the Drying Systems Velocity Switch, a device used to make or break electric circuits according to velocity of the air passing through a duct or other enclosure. Thus this unit assures that heating units will not operate if air flow fails. Drying Systems Co.



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For more data circle 408 on Postpaid Card

92. Water-Wash Spray Booth Compound
Information on Perj, a low-foam purgant for use in water curtains of water-wash spray booths. DuBois Chemicals, Incorporated.

93. Stripper
Folder describes No. 153 Stripper, a non-flammable volatile solvent-type stripper with very little toxicity. Has excellent penetrating properties, is said to be useful in removing coatings that are difficult to remove, such as melamines, epoxies, vinyls, plating rack coatings. Dytex Chemical Co.

94. Drum Trucks
Information on a new hand truck for fast handling of drums. Many new features. Economy Engineering Co.

95. Electropolishing Stainless Steel
Literature on baths for electropolishing stainless steel includes operating instructions for two of these baths. Electro-Glo Company.

96. Temperature Control
Folder describes the Eltemp regulator, a device which registers temperature variation over the entire submerged surface of its long probe, thus taking account of temperature variation at various depths in the solution. Built for use in plating tanks. Elkhart Controls Co.

97. Silver Anodes
Information on silver anodes produced by the AP & S extrusion process to produce controlled grain size so that corrosion is smooth. Available in "DogBone," "Rectangular," and "Tear Drop" shapes. American Platinum & Silver Div., Engelhard Industries, Inc.

98. Immersion Gold Plating Solution
Information on Atomex immersion gold plating solution, which will deposit a thin coating of gold on many parts by simple immersion. Engelhard Industries, Inc., Chemical Div.

99. Stripping Photo Resists
Operating instructions for Stripper K, a product formulated for removing photo resists from printed-circuit boards. Acts quickly, operates at room temperature, is non-flammable, free rinsing, does not attack most printed circuit boards. Enthone, Inc.

100. Blast Media, Wet
Information on Exolon Fastblast, an aluminum oxide abrasive in small particle sizes that can be suspended in liquid and then thrown against the work to be finished. The Exolon Co.

You Protect Your Reputation When You Protect and Beautify Your Product With

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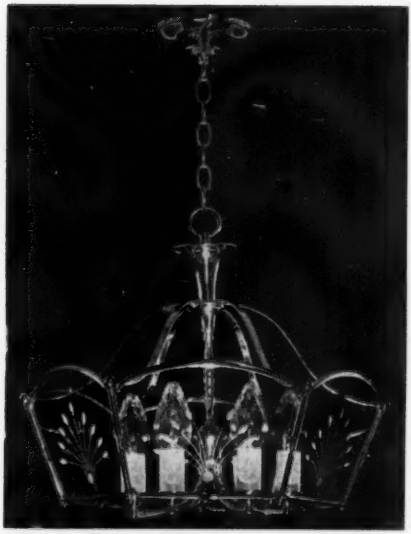

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101. Bright Nickel Process
Information on the Levelmax process. Assures bright, smooth nickel plates over poorly polished steel, dull copper plate, unbuffed stampings and castings. Simple to control and maintain. Federated Metals Div., American Smelting & Refining Co.

102. Flexible Contact Wheels
Catalog No. 12 describes Formax flexible contact wheels for grinding, polishing, sanding and finishing with coated abrasive belts. These wheels are said to produce sharper, faster cutting action plus finer and smoother work surface. Formax Manufacturing Corp.

103. Tumbling Media
Information on preformed tumbling media and abrasive products. Over 200 sizes and bonds available. Fortune Industries, Inc.

104. Dust Collectors
Catalog DK-820 describes and illustrates the large Model DK-1055 and other dust and mist collectors. Hammond Machinery Builders, Inc.

105. Nickel Sulfamate Plating
A 16-page technical instruction bulletin describes H-VW-M Nickel Sulfamate plating process, used for heavy build-up in metal resizing, electroplating, electroforming, functional uses. Complete description of solution preparation for both still and barrel plating operations. Solution is premixed—no dry chemicals to dissolve, except nickel chloride, when desired. Hanson-Van Winkle-Munning Company.

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106. Centrifugal Deburring and Polishing Machine
Information on the Harperizer, a new machine for quickly producing fine, smooth finishes on parts by processing in loose abrasives without fixtures. Harper Buffing Machine Co.

107. Bright Nickel
Information on the Nubrite bright nickel plating process. Operates successfully with either air or mechanical agitation. The Harshaw Chemical Co.

108. Cadmium Bright Dip
Technical bulletin on Rodip CD-4 bright dip, a product formulated for use in rapid manual operations. Powder dissolves in water. No other chemicals need be added. Produces brilliant, stain-free finish. R. O. Hull & Co., Inc.

109. Tack Rags
Literature on Ideal Tack Rags, specially treated cloths that pick up dust and other particles just prior to application of an organic finish. Ideal Chemical Co.

110. Centrifugal Pumps
Bulletin 301 gives specifications and dimensions for 8 sizes of centrifugal pumps. Materials of construction, linings available, performance curves, typical product usage data. Industrial Filter & Pump Mfg. Co.

111. Finishing Small Parts
An advanced system for producing corrosion resistant organic finishes on fasteners and small parts is described in a technical bulletin that is entitled "A Two-Phase System for Producing Corrosion-Resistant Coatings Using Bulk Handling Methods." Reported performance of tested pieces shows the system will produce finishes to meet existing rust proofing specifications of fastener users, and can be engineered to meet anticipated stricter specifications. International Rustproof Corp.

112. Brass Additive
Information on an additive formulated to increase efficiency and throwing power of brass plating solutions. Jelco Finishing Equipment Corp.

113. Phosphate Coating
Bulletin F21 on Keykote 25, a dense complex phosphate coating that embodies iron, zinc, manganese and ferromolybdate while competing with iron phosphates. Kelite Corporation.

114. Fume Control System
Booklet F shows typical installations of Kirk & Blum fume-control systems. Kirk & Blum Mfg. Co.

115. Finishing Systems
Information on Koch conveyorized paint finishing systems. George Koch Sons, Incorporated.

116. Electronic Thickness Tester
Bulletin 400 gives details on the Kocour Electronic Thickness Tester, includes "question and answer" section. Kocour Company.

117. Plating Course
Information on a correspondence course in electroplating. Joseph B. Kushner Electroplating School.

118. Baking and Drying Equipment
Catalog No. 560 describes and illustrates various types of baking and drying equipment. The Lanly Co.

119. Junior Automatic Plating Machine
Catalog on the Daw Junior fully automatic plating machine. Has provision for automatic cycle selection, automatic unloading, easy modification. Lasalco, Incorporated.

120. Abrasive Finishing Data Sheet for Solid Silver and Silver Alloys
Step-by-step technical data on how to produce such finishes as dull matte, dull satin, Butler, semi-mirror and mirror. Recommendations for compounds, wheels, wheel speeds, buff lubrication. Lea Manufacturing Co.

121. "No-Air" Spray Painting Equipment
Bulletin 404R describes airless hydraulic Dyna-Spray equipment and accessories. Specifications for four units, portable and stationary. Lincoln Engineering Co.

122. Media and Compounds for Barrel Finishing
Four pages on media and compounds for barrel finishing, vibratory finishing. New formulae devised for vibratory finishing. Preformed and natural media. Lord Chemical Corporation.

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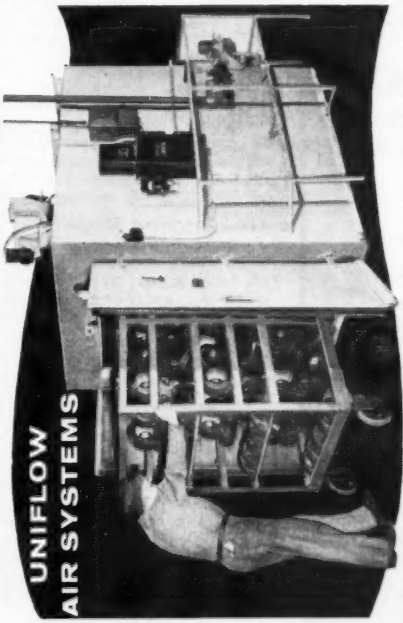

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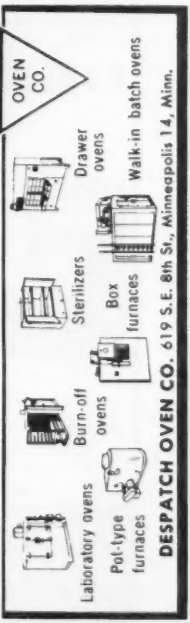

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123. New Paint Finish
Information on Ep-O-Spra, an organic finish that looks like special metal finishes, is durable, economical and easy to apply by spraying. Resists heat, abrasion, impact, acids. Lowe Brothers Company.

124. Stripping Copper from Printed Circuits
A new liquid chromate for stripping (etching) copper from printed circuits is described in Data Sheet 115, a three-page usage and instruction sheet. Metex Circuit Etch B strips rapidly, will not attack lead-tin, gold, rhodium or inks. MacDermid, Inc.

125. Cleaning Guide
A 32-page manual entitled "Cleaning and Preparing Metal Surfaces." Magnus Chemical Co., Inc.

126. Paint-Finishing Equipment
Catalog A-661 contains data on complete finishing systems, metal-cleaning equipment, spray-, dip-, and flow coaters, drying and processing ovens, special plant and production equipment. The R. C. Mahon Co.

127. Solution Cooler
Bulletin AC-1 describes a packaged refrigeration system designed for cooling plating, anodizing and other corrosive solutions. No coils in tank. No external heat exchanger. Mayer Refrigerating Engineers, Inc.

128. Synthetic Pearl Essence
Revised edition of 8-page Nacreous Pigment Handbook covers Murano colors, synthetic pearlescent finishes in color, and Mearlite, a non-lead pearl pigment. Mearl Corporation.

129. Chromium Plating Compounds
Folder on new fume-controlled SRHS Compounds. These solutions contain chemicals which automatically reduce misting and fuming. Metal & Thermit Corporation.

130. Automatic Agitating Washer
Information on The Mersa-Matic, a compact machine for batch cleaning and treating metal parts. Industrial Div., Metalwash Corporation.

131. Finishing Systems
Bulletin shows integrated systems for applying organic coatings. Shows typical installations, describes product being painted along with specifications for the system in use. Michigan Oven Co.

132. Glass Shot
Information on Microbeads Glas-Shot, microscopic glass beads for use in wet and dry blasting equipment for cleaning, polishing, peening and finishing. Microbeads, Inc.

133. Heat-Resistant Finish
Sicon, a finish that withstands high temperatures, is described in a brochure which presents a complete table of properties, characteristics and application data. Midland Industrial Finishes Co.

134. Tumbling Shape
Technical booklet on Honite Brand C-R Tumbling Shape tells how this truncated triangular pyramid reaches inaccessible workpiece areas, improves barrel finishing results. Minnesota Mining & Manufacturing Co., Dept. FI-39.

135. Drum-Handling Tools
Literature on a line of drum-handling tools and equipment: drum wrenches, drum upenders, carts and so on. Morse Mfg. Co., Inc.

136. Plating Rack Coatings
Munray PC-7 rack coating can be applied by dipping or brushing, requires no primer or bake. Munray PC-11, a paste, adheres permanently at temperatures up to 190 deg. F., is a good insulator, has good resistance to abrasion. Complete data available. Munray Div., Textron, Incorporated.

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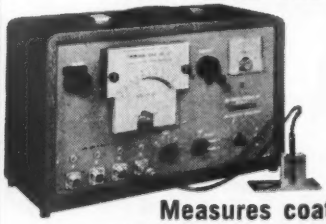

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137. Protects Polished Surfaces from Scratching
Information on 6100-B Protecto-Mask, a tough, self-sticking paper that protects highly polished or plated surfaces from scratches, gouges, oil marks and blows. Peels off easily, leaves no residue. Mystik Adhesive Products, Inc.

138. Orbital Sander
Catalog describes and illustrates the Mity-Midget, an orbital sander that weighs only four pounds, yet cannot be stalled even by standing on it. National-Detroit, Inc.

139. Water-Dip Lacquer
Information on Nikolas water dip lacquers. Protect silver, brass and copper from tarnish. Wet parts coming from last water rinse immediately go into the water-dip lacquer. G. J. Nikolas & Co., Incorported.

140. Hot Airless Spray
Eight pages. Good "popular" description of the airless spray painting process: theory and practical application. Advantages, equipment needed, answers to common questions. Nordson Corp.

141. Phosphate Coatings
Four-page brochure on Northwest Interlox phosphatizing compounds describes products for soak and spray operations, wiping on large parts, and so on. Also gives information on precleaners, cleaning addition agents, acidulated rinses. Northwest Chemical Co.

142. How To Remove and Prevent Rust
Service Bulletin No. 16B tells how to remove rust safely from raw stock; how to prevent hydrogen embrittlement when removing rust; how to simultaneously remove rust and grease and condition metal for paint at the same time; how to prevent rust between processing stages. Oakite Products, Inc.

143. Polishing Composition
Information on Myers Miracle, a product that is said to grease, polish, and preserve abrasive belts. Myers & Ellis, Inc.

144. Blast-Cleaning Barrels
Bulletin No. 706, a 16-page booklet, contains descriptions of five types of blast-cleaning barrels. Outstanding features of the abrasive impeller in these units are described and illustrated. Pangborn Corporation.

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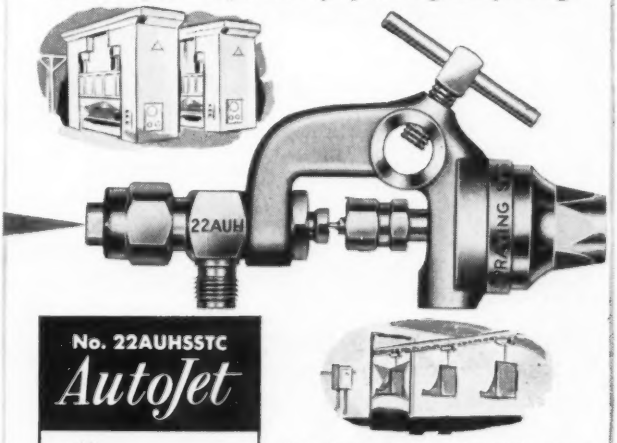

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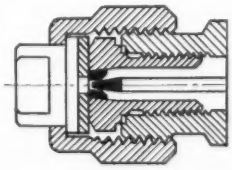

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FOR INFORMATION WRITE FOR BULLETIN 96

For more data circle 413 on Postpaid Card

145. Strippable Vinyl Coatings
Four-page folder MP-314 describes strippable vinyl coatings for protecting surfaces during processing and in storage. Includes data on typical uses, application and removal. Pennsalt Chemicals Corporation.

146. Magnets
Information on all sizes, shapes and grades of magnets—Alnico and ceramic, sintered, cast. Permag Corp.

147. Industrial Gloves
Gloves cataloged and classified according to use, material, dexterity required, abrasion resistance, chemicals used, other factors that aid the user in selecting the proper glove for a specific task. Pioneer Rubber Co.

148. Cathode Rod Agitators
Data sheet describes features of the company's cathode rod agitators. Ramco Equipment Corp.

149. Electrostatic Spray Gun, Hand-Held
Twelve pages. "Spray Painting with the Electrostatic Hand Gun." Principles and uses of recently introduced hand-held electrostatic spray painting gun. Photos of production applications. Ransburg Electro-Coating Corp.

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150. Silicon Rectifier
Data sheet on a new 1500-ampere, 2-12-volt silicon rectifier. Rapid Electric Co.

151. Paint Conditioner
Complete data on machines for shaking containers of paint to mix and rejuvenate settled-out paint, blend colors in paint. Red Devil Tools.

152. Disposable Spray Booth Air Filters
Folder describes and illustrates the use of RP paint arrestors, disposable filter pads that are used in spray booths to remove paint solids from exhaust air. Research Products Corp., Dept. 38.

153. Air Processing Equipment
A 12-page bulletin includes data on ovens, dryers, air heaters and curing systems for use in such industries as pulp and paper, paint finishing, rubber and foam rubber, foundries, plastics and chemical processing. Bulletin No. S-5. J. O. Ross Engineering, Div. of Midland-Ross Corporation.

154. Barrel Finishing Equipment
A 24-page catalog on barrel finishing sets forth a clear explanation of mechanical finishing processes, tells how barrel finishing can be used in grinding, deburring, descaling, polishing and coloring of metal parts. Includes data on Roto-Finish barrel finishing machines, chip bins, separators, dryers, screens and so on. Roto-Finish/Ransohoff.

155. New Wool Polishing and Compounding Pad
Information on the Ray-Buf, a new all-purpose polishing and compounding pad that is said to produce higher lusters more quickly. Schlegel Manufacturing Company.

156. Immersion Boiler
Bulletin 5209-A describes the Sellers trouble-free immersion boiler, a simply designed unit with no open flame, positive-pressure blower, self-cleaning tubes, low-cost maintenance. Sellers Engineering Company.

157. Gold Plate
Technical data on the Temperex Process, an acid-type electroplating formulation that produces pure 24-karat gold deposits to any desired practical thickness. Adaptable to both still and barrel plating. Bulletin 175B. Sel-Rex Corp.

158. Filter-Pump Selection Guide
Bulletin M-1. Eight pages. Lists many electroplating and industrial solutions and the filter pumps recommended for each. Data and facts about components and materials of construction. Illustrations and specifications for 20 representative models, ranging in capacity from 50 to 2700 g.p.h. Sethco Manufacturing Corp.

159. Electroplating Equipment
Information on a line of electroplating and allied equipment: corrosion-test cabinets, barrel plating equipment, replacement barrels, plexiglas baskets, buckets and lab tanks. The Singleton Company.

160. Automatic Plating Machines
An eight-page bulletin on Stevens automatic rack processing and plating machines for electroplating, anodizing, stripping, cleaning, phosphatizing and similar immersion processes. Frederic B. Stevens, Inc.

161. Airless Spray
Information on the complete line of HydraAirless 20 Systems is given in Catalog Sheet PM 918. Spee-Flo Company.

162. Vibration-Finishing Equipment
An eight-page folder describes and illustrates Vibra-Speed finishing equipment. Excellent for deburring and finishing interior surfaces, faster than conventional barrel finishing equipment. Speed-D-Burr Corp.

163. Finishing Systems
A 36-page book describes and illustrates complete finishing systems and components such as washers, dryers, bake ovens, flow coat systems, dip-painting systems, spray painting systems, others. Includes diagrams of several systems, comparison of operating costs for Spra-Con systems vs. other types. Also has a page of useful engineering formulas and constants. The Spra-Con Company.

164. Spray Gun, Airless
Bulletin 95-A describes Model H 22HPSSTC GunJet for airless spray painting. Listing of major spray-tip patterns, materials, coverage. Spraying Systems Company.

165. Vapor-Recovery Systems
A 4-page folder describes equipment for recovering from vapor degreasers the solvents normally exhausted outdoors or to the working area. Vic Manufacturing Company.

166. Plating Barrel
Data sheet on a plating barrel with "cone button contacts." This type of contact is useful in plating delicate parts without distortion. Barrel is of loose rib and panel design for easy replacement of parts. The Stutz Co.

167. Zinc Plating Additive
Data on Zinc Brite, a cleansing and

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purifying agent for cyanide zinc plating solutions. Sulphur Products Co., Inc.

168. Sanders, Air-Operated
Data on portable air-operated sanding machines. Sundstrand Machine Tool Div. of Sundstrand Corp.

169. Lapping-Polishing Machines
Catalog on lapping-polishing machines presents complete descriptions, specifications and other data on four Syntron vibratory lapping-polishing machines. Syntron Company.

170. Immersion Gold
Information on Oro Merse, a neutral immersion gold for the production of 24 Kt gold plates up to 10 millionths, direct on copper, brass, nickel, iron, lead and solder plates. Technic, Inc.

171. Etch Primer
Data on Gripalloy, an etch primer available in black and colors. Used as primer or finish coat. Tenax Finishing Products Company.

172. Immersion Heater
Complete technical data on the SSB immersion heater, a unit that features ease and simplicity in replacing the heating element. No need to drain the container. Improved heat-transfer efficiency. N. J. Thermex Co., Inc.

173. Cob Grit for Blasting, Tumbling
Information on corn cob grits that are used as tumbling media and in blast cleaning. Ti-Co Industries, Inc.

174. Belt Sanders
A 4-page folder describes Model TOP Timesaver "Speedbelt" Sander. It details the construction features of this unit, gives specifications for four models. Several applications are shown. Timesaver Sanders.

175. Brass Plating Solution
Technical bulletin on True Brite brass solution, which is available in a variety of colors. True Brite Chemical Products Company.

176. Phosphatizing Reference Chart
Full information on Paintite and ten other phosphatizing and conversion-coating processes. Includes phosphatizing reference chart. Turco Products, Incorporated.

177. Finishing Systems and Components
Photos of installations for cleaning and pickling; electroplating; anodizing. Also lists other individual equipment items available from this company, such as tanks, filters, degreasers, barrel plating equipment, etc. Turnkey Engineering Co., Incorporated.

178. Easily Repaired Plating Cylinders
Folder on the new Udylok-Tempron barrel plating cylinder. This cylinder has interlocking construction which makes it possible to repair and replace panels quickly in the shop. Udylite Corporation.

179. Sorting and Matching Metals and Alloys
Bulletin No. 2 tells how to use the Dermitron Thickness Tester to sort and match various metals and alloys. Unit Process Assemblies, Inc.

180. Universal Coating
A versatile coating for unusually difficult surfaces. Available in all colors in flat or gloss. Serves as primer or topcoat or both. May be air dried or baked. Used on iron, copper, brass and zinc. United Lacquer Mfg. Corp.

181. Powdered Polyethylene
An 8-page booklet on Microthene, polyethylene in powdered form. Lists applications, including application of coatings by the fluidized bed process, tells how to use in spray coating, dip coating, slush coating, flock spraying, and so on. U. S. Industrial Chemicals Co., Div. of National Distillers and Chemical Corp.

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182. Hints on Jar Milling
Bulletin JM-290 contains helpful grinding and mixing data plus full details on "U.S." Jar Mills. Process Equipment Div., U. S. Stoneware.

183. Anodes
Folder lists various types of brass, cadmium, copper, lead, nickel and alloy anodes. Includes detailed information on new "T-Bone" nickel anodes, said to offer reduced sludging, smoother deposits, increased surface area and rapidity of anode corrosion. Univertical Corporation.

184. Acrylic Coatings
Performance and application information on acrylic-based coatings. The Varnish Products Co.

186. New Ultrasonic Cleaning Equipment
Information on ultrasonic cleaning equipment recently developed by Westinghouse. Compact, efficient, sturdy, excellent performance. Westinghouse Electric Corporation, Industrial Electronics Dept.

187. Industrial Heating Catalog
Catalog Supplement CS-600 contains specifications and product illustrations of electric heater bands, air-heating elements, blower-type heaters, immersion units, engine heaters, insulated heating cable, special radiant heaters for process and comfort heating, controls and other elements and equipment. Edwin L. Wiegand Co.

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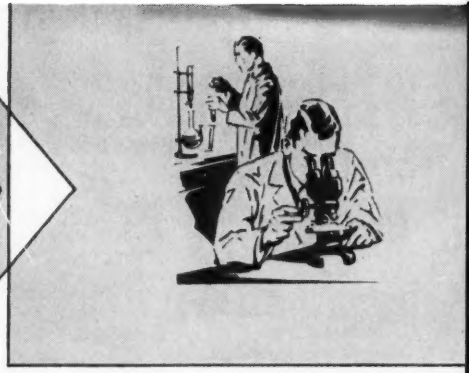

(Suggested solutions to problems submitted by readers. Send your problems to our Editorial Staff. There is no charge.)

Cadmium or Zinc Plated Products

Question: *Many parts that we use in our products are either cadmium plated or zinc plated. These parts are usually small in size—machine screws, washers, formed clips and anchors; but occasionally we require these finishes on larger parts. The volume is not great enough to justify setting up a plating department in our plant, so we have this done by various plating shops in this area. In specifying the finish, we merely say "cadmium plated" or "zinc plated" with no specification with respect to coating thickness, continuity, or surface appearance.*

Please direct me to a source of information that could provide a basis for writing plating specifications keyed to the construction and use of the part.

We have been accepting either zinc or cadmium because we believe them to be about equal in their ability to protect the steel parts. About the only exception to this is on exposed surfaces where we insist on cadmium plating because it remains bright and attractive for a longer time. I would also like to know if there is a difference in their protective properties and, if so, when should each be specified. Most of the items are either directly exposed to weather or are only partially sheltered.

If we get the information I am asking you for, and more complete specifications are written, it will then be necessary to have a way to be sure the specifications have been met. I would like you to supply information on recommended methods and equipment for inspecting plated materials.

E. L. C.

Answer: The American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania, has published two standard specifications covering cadmium-plated and zinc-plated parts. ASTM Specification A-164-55 covers electrodeposited coatings of zinc on steel. The specification suggests three thicknesses based on the service requirements. The thickness specified for average service requirements is 0.0005 inch which, I might add, should be ample for parts subject to interior corrosion. For parts which must stand up under outdoor corrosive conditions, perhaps the other recommended thickness of 0.001 inch should be specified.

ASTM Specification A-165-55 covers electrodeposited coatings of cadmium on steel. Again, three thicknesses of plating are recommended, based on severity of exposure. The thickness recommended for average service conditions is 0.0003 inch which, again, has been an industry standard for many years.

Both cadmium and zinc deposits can be treated by bright dipping to secure additional service life. I believe it might be well to add to your specification that the parts be treated so that the surface will have "a clear chromate conversion coating."

(continued)

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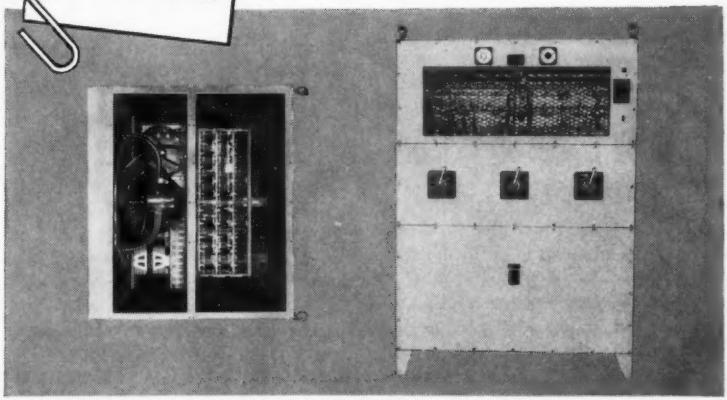
No. 3471

ELECTROPLATING INDUSTRY



INDUSTRIAL PLATING COMPANY • CLEVELAND, OHIO

Reduces Power Costs 36%

by installing a

SYNTRON RECTIFIER POWER UNIT

Slightly less than a year ago, Industrial Plating Company of Cleveland, Ohio replaced a motor generator and selenium rectifier power unit with a Syntron 6000 amp, 5-15 volt Silicon Rectifier Power Unit. A spokesman for the Company declares that since this unit was installed, power bills have not exceeded $700.00 a month against an average of $1100.00 per month with the old units. This is a 36% reduction in power cost.

Syntron Rectifier Power Units provide instantaneous operation efficiency, long life, high power factor from 92 to 97.5%, low operating and maintenance cost.

Syntron Rectifier Power Units are designed for industrial applications. Each according to Specific power needs. This savings in power costs realized by Industrial Plating Company can apply to your operation.

Write for complete information.

SYNTRON

SYNTRON COMPANY

452 Lexington Avenue • Homer City, Pa.

For more data circle 383 on Postpaid Card

If you want maximum corrosion resistance from cadmium plated parts, the ASTM recommendation is a thickness of 0.0005 inch.

Cadmium and zinc protect steel parts differently in different environments and under different conditions. Cadmium is superior in salty atmospheres and zinc is superior in sulfur-containing or industrial atmospheres. For most purposes, industry thinking indicates that cadmium is slightly superior to zinc.

Leading companies in the industry will be glad to offer recommendations as to whether cadmium or zinc should be used to protect various steel parts used in your assemblies. It is quite possible that you will find that cadmium plate with a chromate conversion coating will be recommended.

One quick way of determining whether plating specifications have been met is by a very simple test of plating thickness. Complete information on testing equipment can be obtained from the companies listed in the PRODUCTS FINISHING DIRECTORY on page 210 under the heading, "Testing Devices, thickness."

The PRODUCTS FINISHING DIRECTORY also lists manufacturers of plating supplies, plating solutions and testing equipment under appropriate categories.

Red Rocker
BARREL STANDS

Get the drum into "ready to drain" position quickly and safely, 18" drain height with sparkproof wheels, all welded model 18 WW Price $16.00 each f.o.b. Chicago.

Other models available.

ECONOMY ENGINEERING 4513 W. Lake St., Chicago 24, Illinois

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Ceramic Finishes

Question: *We are manufacturers of floor sanding and polishing machines, and are interested in a sprayed decorative ceramic finish (or equivalent) on steel parts such as the housings and handles of machines.*

The process we have in mind is the same coating as used by companies that make cooking utensils. Can you give us any information as to source of supply?

W. J. F.

Answer: Application of ceramic finishes is somewhat similar to application of organic finishes in that both can be spray applied and both can be applied by dipping. The biggest difference between the two is that application of porcelain enamel requires firing at high temperatures (in the neighborhood of 1,000 deg. F.) and this requires a special furnace.

For detailed information about porcelain finishing, we would suggest that you get in touch with the companies listed under "Porcelain Enamel, Accessories, Equipment and Supplies" on page 215 of the PRODUCTS FINISHING DIRECTORY.

★ ★ ★

Tumble Painting of Metal Stampings

Question: *We would appreciate some information or data on one of our serious painting problems.*

We are coating various sizes of metal stampings and drying the paint with an oven in a rotating conical barrel. We find that the parts nest together after the application of paint. Considerable force is required to separate the parts.

Any data on paint additives or techniques would be greatly appreciated.

J. C.

Answer: Generally, the paint used in centrifugal painting should be formulated for minimum flow. Many paint manufacturers can recommend paint

formulated with the proper solvents so that your problems of nesting and sticking will be minimized.

With this letter we are forwarding a copy of the PRODUCTS FINISHING DIRECTORY in which you will find a number of manufacturers of enamel listed on pages 105 through 108. You may wish to direct your inquiry to some of these companies to secure the proper paint.

★ ★ ★

Anodizing and Coloring Aluminum

Question: *We anticipate an increasing volume of colored anodized aluminum to be used for interior and exterior trim.*

We may consider utilizing the production technique and would be interested in any available information you would supply us concerning distributors and techniques of anodizing aluminum.

W. J. W.

Answer: We are enclosing copies of three articles from PRODUCTS FINISHING which give information on anodizing:

"Four Steps to Successful Anodizing"

"Adams and Westlake's 'Stoppage-Proof' Anodizing System"

"Techniques for Coloring Anodized Aluminum"

We are sending a copy of the PRODUCTS FINISHING DIRECTORY. Manufacturers of equipment for anodizing are listed under "Plating and Anodizing Equipment," and also under "Plating and Anodizing Equipment, automatic."

Manufacturers of dyes used for anodizing are listed under "Dyes, anodizing."

These companies can give you considerable information about the equipment and materials required.

The aluminum producers are also good sources of information.

PAINT STRIPPER

THE NEW MIRACLE

STRIPEX #153

NO HEAT NECESSARY!

A mild steel tank is all that is required. Strips All Types of Baked Enamels. Some Baked Coatings are Stripped Clean in a matter of Seconds. Excellent for stripping vacuum metallizing racks.

DYTEX CHEMICAL COMPANY

DYTEX

Chemical Specialties

PROVIDENCE 3, Rhode Island

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news of the finishing industry

company news
new positions
new plants
meetings

NEW PLANTS

New Company To Produce Cleaning and Finishing Equipment

A new company, AutoSonics Inc., Philadelphia, has been formed to design, manufacture and distribute the new AutoSonex automated ultrasonic cleaning machine. The company will also produce conventional industrial cleaning equipment and paint-finishing systems. President of the new company is Burton Rand.

New Warehouse Facilities for Sprayon Products

Sprayon Products has expanded its Cleveland plant to increase warehouse space. With 30,000 square feet of floor space, the new facilities will accommodate 600,000 aerosol cans ready for shipment, the company reports.

Bacon Felt Expands Manufacturing Facilities

Bacon Felt Company has acquired an additional 17,000 square feet of manufacturing area at 15 Fourth St., Taunton, Mass., in a building adjacent to Bacon's present plant, according to an announcement by Stanley N. McNeilly, treasurer.

The new area will house the expanded blending department and will make possible a more efficient arrangement of the entire manufacturing operation. Additional blending and carding machinery has been purchased and will be installed early in 1961.

Warehouse facilities in the building have been expanded by Sprayon Products, Inc.

TRAINING COURSES

Class in Electroplating—Chicopee, Mass.

An electroplating course sponsored by the Springfield Branch, A. E. S., and the Chicopee Vocational High School is being given in Chicopee, Mass. The 12-week course is free to residents of Massachusetts.

Lectures will be given on basic principles, racking, electrocleaning, pickling, degreasing, bright dipping, polishing, buffing, barrel finishing, dull nickel plating, copper plating, brass plating, bright nickel plating, chromium plating for decorative and industrial purposes, gold, silver, rhodium, platinum, and palladium plating, cadmium and zinc plating, anodizing, phosphate coating, stripping deposits, solution filtration and purification, shop safety, plant layout, trouble shooting, plating.

Instructor is Robert J. Girard, 146 Waite Ave., Chicopee Falls, Mass. Mr. Girard is foreman of metal finishing shops, Springfield Armory.

MEETINGS of INTEREST to FINISHERS

Feb. 18. Educational Session and Dinner-Dance, San Francisco Branch, A.E.S., Jack Tar Hotel.

Mar. 3-4. Annual Technical Session and Banquet, Philadelphia Branch, A.E.S., Benjamin Franklin Hotel, Philadelphia.

Mar. 4. 15th Annual Educational Session and Dinner Dance, Dayton Branch, A.E.S., Biltmore Hotel, Dayton, Ohio.

Mar. 11. Annual Meeting, Rockford Branch, A.E.S., Rockford, Ill.

Apr. 8. Annual Educational Session and Dinner Dance, Los Angeles Branch, A.E.S., Los Angeles, Calif.

Apr. 15. Annual Banquet and Dance, Baltimore-Washington Branch, A.E.S., Baltimore, Md.

June 18-23. 48th Annual Convention, A.E.S. (National), Hotel Statler, Boston.

AGATEEN

AVALANCHE!!!

We were avalanched with trial orders for our AGATEEN PONETIC No. 1 advertised in January publications. Shipments are going out daily. You will get your PONETIC No. 1 soon!

Bakes hard at 300° — 5-10 Min.
Flexible, Durable, Attractive
No samples—minimum order accepted 1 gal.

AGATE LACQUER MFG. CO., INC.
SERVING INDUSTRY SINCE 1927
11-13 43rd Road
Long Island City, N. Y.
Stillwell 4-0660-1

AGATEEN
THE LAST WORD IN QUALITY

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ANODIZERS

SAVE

- SAVE MOST OF RACK COST
- SAVE MOST OF MAINTENANCE
- SAVE MOST OF STORAGE SPACE
- SAVE MOST OF REJECTS
- SAVE PART OF YOUR CYCLE PROCESS
- SAVE DUPLICATION OF RACKS BECAUSE OF ADJUSTABILITY
- SAVE CUSTOMERS DUE TO IMPROVED QUALITY
- SAVE DELIVERY TIME TO CUSTOMER WITH SERVI-SURE STOCK RACKS

Send for our Free 1961 Catalog and Price List illustrating our complete **NEW** line of aluminum and **ALL TITANIUM** standard stock racks. Engineering analysis of your racking problems **FREE!**

Write today to
SERVI-SURE MFG. CO.
Dept. MM, 131 N. Green St., Chicago
Or call CH 3-7383
Anodizing Rack Specialists since 1947

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COMPANIES

Mahon Completes First Phase of Modernization Program

R. C. Mahon Co., Detroit maker of paint-finishing systems, has completed the first phase of the multi-million dollar seven-year modernization program at its Structural Steel Division.

With capital expenditures of over $600,000 since the program began two years ago, the company has installed the structural steel fabricating industry's first numerical-positioning-controlled drilling machine, built the industry's largest paint-conveyor system, and installed modern, high-speed welding equipment.

During the next five years, Mahon management plans to replace with new machinery the balance of all production equipment in the Structural Steel Division at the company's 76-acre, ¾-mile-long plant at 6565 E. Eight Mile Road in Detroit.

"The objective of our modernization program," states W. F. Sheetz, Mahon's president, "is to fabricate steel structures in the shortest possible time and at the lowest possible cost. We are meeting this objective through greater integration of our plant operations with modern metalworking methods combined with the latest materials handling and live storage techniques."

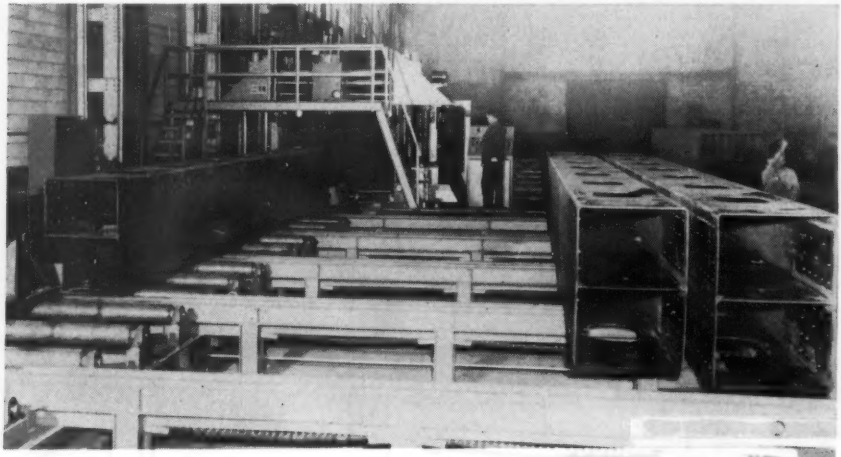
The most important step in the modernization program to date is the installation of a numerical-positioning-control drilling machine (Fig. 1). Cost savings of approximately 85 per cent in producing holes are achieved with this machine in its initial application on structural components for the nation's first 100,000-p.s.i.-yield-point bridge.

Previous methods for producing holes in structural-steel components at Mahon included radial drilling and various methods of punching, depending on stock thickness. The cost savings produced by the new machine are attributed directly to the elimination of hole pattern layout operations, the use of high-speed drilling, and application of automatic conveyorized feeding of beam and column sections into, through and out of the tape-controlled drilling machine.

Accuracy of hole pattern is another distinct advantage resulting from numerical drilling. With the new machine, hole patterns are repeatable within ±0.005 inch.

W. E. Willard, Mahon vice president and manager of the Structural Steel Division states, "The drilling of both detail plates and built-up sections are ultimately planned to be carried

Fig. 1—Hole patterns in welded high-strength steel bridge member being drilled by tape control at the R. C. Mahon plant. New system is part of company's modernization program.



out by numerical-control methods.

The conveyorized paint system (Fig. 2), which was the first step in Mahon's extensive modernization program has cut painting costs in half. Measuring 15 feet wide and 400 feet long, this paint conveyor, which includes a Mahon paint spray booth, is the largest in the industry. Two stations, one above and one below the conveyor, complete the painting in one continuous operation (Fig. 3).

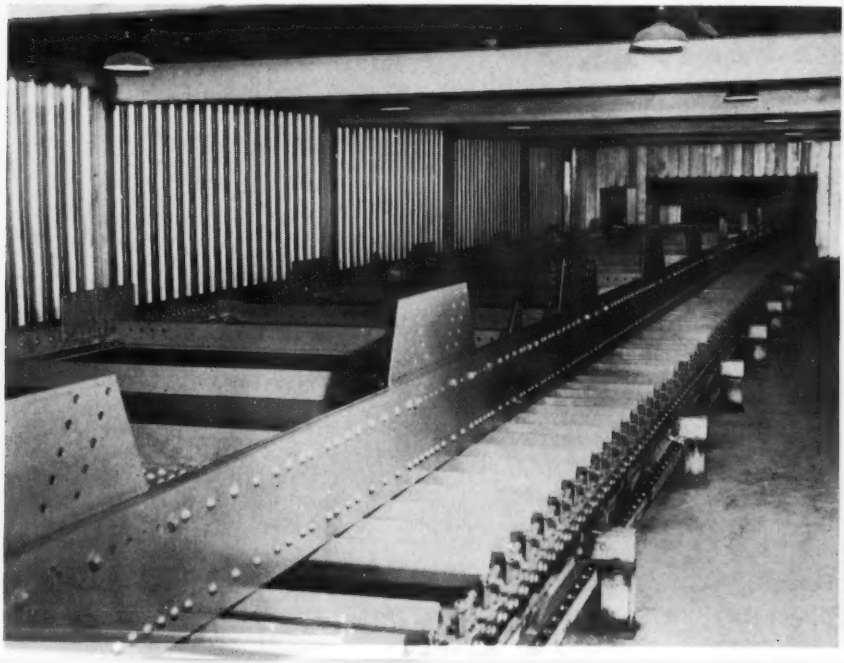
Previously, the large structural assemblies, many weighing up to 50 tons and measuring up to 96 feet long, were laid flat on the floor of the plant, painted on one side, turned over, and painted on the other side. This procedure required considerably more crane manipulation of cumbersome components, wasted paint and resulted in excessive down-time of painting operations and personnel.

With the new conveyorized paint

(continued)

Fig. 3 — Two paint stations, one below (shown) and one above the conveyor, complete painting operations in one continuous operation. The recently installed system makes it possible to paint approximately four times as much structural steel as previously used manual methods. (Photographs courtesy R. C. Mahon Co., Detroit 34, Michigan.)

Fig. 2—Paint conveyor system at Mahon measures 15 feet wide and 400 feet long. The 20-ton girder shown was painted in 16 minutes. Conveyor moves at approximately five f.p.m.



system, a crane transfers the components from the final fabricating and cleaning operations, directly to the paint conveyor. The conveyor moves at 5 f.p.m. and has a capacity of ¾ ton per linear foot. This results in a theoretical capacity, with very heavy structural members, in excess of 1500 tons per eight-hour shift. For the average work where the individual pieces are lighter, the new system permits the painting of 200 tons of steel per day in a single shift as compared to the 50 tons per shift limit of the former facilities.

The paint system conveyor extends from the plant interior directly to the shipping area outside of the plant. This presents an added advantage in the general material handling operations in the Mahon plant. Even where completed structural components are not painted, they still are transferred to the shipping area by means of the paint system conveyor with minimum handling. With the conveyor in constant motion, finished structures can be placed on it as they are completed.

Binks To Show Portable Spray Equipment At Rental Equipment Show

Portable spray painting equipment will be shown at the Rental Equipment Show by Binks Manufacturing Company. The show will be held at the Peabody Hotel, Memphis, Tennessee, February 20-23.

BRUKO . . The only company in America with a full line of processing materials. Order your specially formulated products for cleaning, buffing, and polishing from

BRUCE PRODUCTS COMPANY

HOWELL • MICHIGAN

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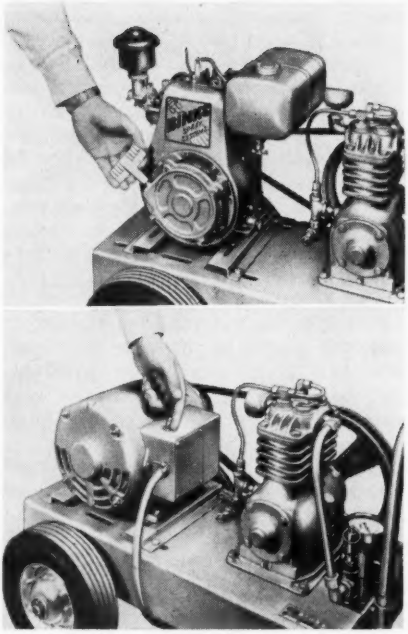


Portable compressor, powered by gasoline engine or electric motor, is one of the items to be shown at the Rental Equipment Show by Binks Manufacturing Company, Chicago.

On display in Booth No. 75 will be portable spray painting outfits, including portable compressors, spray guns, the Wren air-brush, and other related items.

Representing Binks at the show will be Charles Azzarello, Jack Cody, and D. E. Power.

Sel-Rex and Meaker Subsidiary Hold Three-Day Sales Seminar

A three-day seminar for the sales and marketing personnel of Sel-Rex Corporation and its subsidiary, The Meaker Company, was held recently at the Motel On The Mountain, Suffern, New York.

Speakers and their subjects at the Sales Seminars included E. C. Rinker,

vice president and technical director, who spoke on new applications and markets for Sel-Rex's precious metal electroplating processes; J. Ross, assistant general manager, Meaker Company subsidiary, who told the meeting that new markets for Meaker automatic metal finishing equipment had developed for the processing of electronic components on a mass production basis; and Sid Mitwol, general manager, Electrical Division, Meaker Company, who unveiled new developments in semi-conductor rectifier equipment.

Morris M. Messing, president of both companies, welcomed the representatives at the opening night banquet. Mr. Messing was assisted by S. S. Wilson, vice president, sales, in a presentation of Sel-Rex-Meaker plans for expansion in 1961.

Emphasis during the entire conference is said to have been placed on the fact that Sel-Rex is now a complete source of supply for all metal finishing equipment and supplies, from full-automatic platers, filters and rectifiers, to precious metal plating processes and a wide range of chemicals used in electroplating and metal finishing.

Sales opportunities for the unique service provided by Precious Metals Recovery Corporation, recently founded by Sel-Rex-Meaker owner-management, were discussed by Robert H. Messing, who has been serving as assistant to S. S. Wilson, sales vice president, for the past several months.

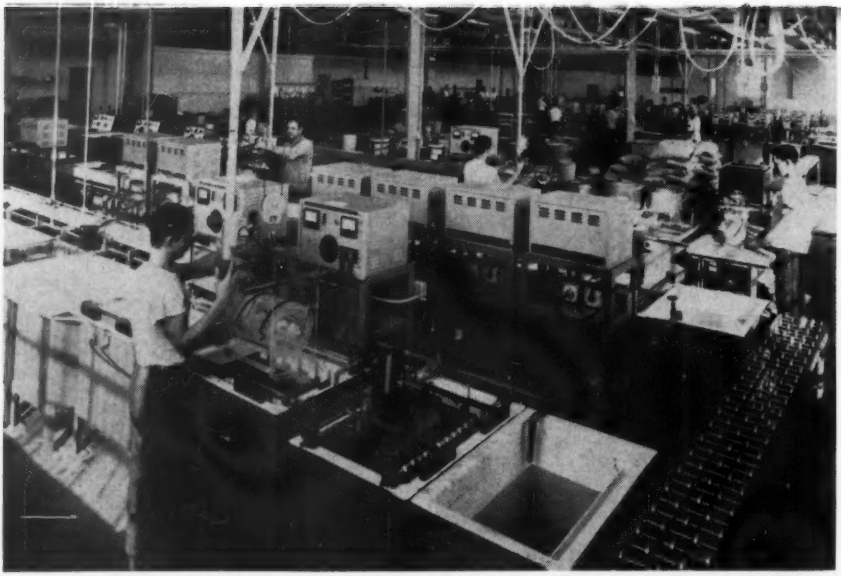
Platronics Unveils Large Plating Facility for Electronics

Platronics, Division of Palumbo Bros., Inc., unveiled what is said to be the country's largest plating facility for electrical/electronic components, during "Open House" at its new building in Linden, N. J.

The more than 300 technical and purchasing executives who attended were treated to a guided tour of the expansive production facilities, including a spacious Research and Development Laboratory. Visitors were also shown a pilot plant where prototypes or sample lots of electronic components will be coated with precious or base-metal plate.

(continued)

Sel-Rex sales and marketing personnel from all over the country photographed at banquet held during their recent three-day Sales Seminar at Motel on the Mountain, Suffern, New York. The meeting featured lecture and discussion periods by technical, sales and marketing executives of Sel-Rex Corporation, and its subsidiary, The Meaker Company.



Partial view of the production area in the new, specially designed Platronics building.

Hosts for the open house were A. J. Palumbo, president; A. F. Palumbo, vice president; A. C. Palumbo, treasurer; and J. R. Palumbo, secretary and general manager.

Wheelabrator Forms Canadian Company

Formation of a new Canadian company, Wheelabrator Corporation of Canada, Ltd., has been announced by James F. Connaughton, chairman of the board.

The new corporation is the successor to the Canadian Division of Wheelabrator Corporation of Mishawaka, Indiana, and was organized to handle expanding sales and fabricating activities for all provinces in Canada.

Wheelabrator supplies airless blast cleaning equipment, abrasives, and dust- and fume-collection systems from its plant in Scarborough, Ontario. It also has an office in Montreal, Quebec.

Harold M. Miller is president and Robert A. Campbell is vice president and general manager and is in charge of Canadian operations. J. D. Lamb is general sales manager.

SOUTH VIETNAM SPEAKS

"I have been assigned to set up and take charge for the Army of the Republic of Vietnam their first electroplating shop expressly for refinishing army signal equipment. My ELECTROPLATING KNOW HOW lessons was my most valuable piece of luggage when I left Manila for my new job," writes plater-chemist Largion Fernandez. From Vietnam to Virginia, EKH is a plater's most valuable asset! Write Dr. Joseph B. Kushner, Box 2066P, Evansville, Ind., for free details.

For more data circle 422 on Postpaid Card

J. D. Lamb

R. A. Campbell

Other officers are Jacob A. Schmidt, Jr., vice president; Edward T. Sullivan, secretary and treasurer, and James E. Donlan, controller.

Cowles Representatives Meet in Waukegan

Cowles Chemical Company, Cleveland, Ohio, officially consolidated the operations of its Metal Finishing Products Department with the recently acquired Promat Division at a week-long December meeting in Waukegan, Illinois. Personnel and territory assignments were announced.

Use characteristics of the company's major cleaning, plating, coating and coloring products were demonstrated under production conditions in the pilot plating plant, after which each man produced finished parts by running them through complete cycles.

Carlton C. Clabaugh, department manager, announced the following organization outline: William J. Stark is sales manager; sales representatives and headquarters are Milton Pascal, New York; George Woleben, Buffalo; Elmer Lord, Cleveland; Clay Sayers, Cincinnati; James Goas, Indianapolis; William Swift, Detroit; George Egger, Chicago; Alexander Alexander, Rockford; Ernest Banner, Minneapolis; George Olbur, Los Angeles; service, Russell Miller, Marvin Siddall.

Production facilities of the Promat Waukegan plant will be moved to Cowles' new plant in Joliet, Illinois, early this Spring. Service laboratory and pilot plating plant equipment will also go to Joliet. A second service laboratory for Eastern customers will be established at the existing Skaneateles Falls laboratories. Order processing, credit and accounting will become part of Cowles' headquarters function in Cleveland.

Correction

On pages 34 and 35 of the January issue of PRODUCTS FINISHING, spray booths were shown and designated as DeVilbiss spray booths. We are advised that these are Binks spray booths.

Cowles representatives shown during a recent meeting held in Waukegan, Illinois.

Pennsalt President Named 1960 Silver-Anniversary All-America Award Winner

William P. Drake, president of Pennsalt Chemicals Corporation, is the single Pennsylvanian on the 1960 roster of Silver Anniversary All-America Award winners announced by *Sports Illustrated* in its December 26 edition. The awards, which went to 25 leading executives and professional men throughout the nation, honor men who played college football 25 years ago and have since gone on to positions of leadership in business and professional careers. Distinguished Americans on the list included a senator, three judges, and a Pulitzer Prize author.

Silver goal post trophies will be presented to each of the winners.

Mr. Drake, who at age 42 became the youngest president in the history of the 110-year-old Pennsalt Chemicals Corporation, was a member of the Bowdoin College, Brunswick, Maine, football team during his college days and was center on the All-Maine Team of 1935. The Bowdoin team lost only one game and was tied once in gaining the state championship.

Columbia-Southern Becomes Division of Pittsburgh Plate

Columbia-Southern Chemical Corporation, a wholly owned subsidiary, became a division of Pittsburgh Plate Glass Company on January 1, 1961 according to David G. Hill, president of Pittsburgh Plate Glass Company.

The new division will operate under the name of Pittsburgh Plate Glass Company, Chemical Division. Principal officers of Columbia-Southern Chemical Corporation have been elected as officers of Pittsburgh Plate Glass Company. Joseph A. Neubauer, becomes vice president and general manager, Chemical Division, and Chris F. Bingham will become vice president-chemical sales.

John E. Rowe Honored at Binks Awards Dinner

John E. Rowe

John E. Rowe, vice president and a member of the board of directors of Binks Manufacturing Company, Chicago, was honored recently for 25 years of service to the company, a manufacturer of spray finishing equipment and water-cooling towers.

At a dinner given in Chicago's Drake Hotel, on December 15, Mr. Rowe was presented a diamond-studded engraved key chain by Burke B. Roche, Binks president.

Telephone collect for free brochure on

OXIDIZING COPPER, SILVER, BRASS, BRONZE

with

McKeon's "Liquid Sulphur"

Processes described in detail.

Sulphur Products Co., Inc.

McKeon Bldg., 621 W. Pittsburgh St., Greensburg, Pa.

For more data circle 423 on Postpaid Card

NEW DISTRIBUTORS

Licensees Named for Pfaudlon 301

Five additional firms have been licensed to apply Pfaudlon 301, a sprayable coating of Penton in water-suspension, according to an announcement by The Pfaudler Co., a division of Pfaudler Permutit Inc. The licensees are Inner-Tank Lining Corporation, Cincinnati, Ohio; Livingstone

Coating Corporation, Charlotte, North Carolina; Tank Lining Corp., Oakdale, Pennsylvania; Hanszen Plastics Co., Dallas, Texas; and Industrial Coatings Corporation.

The new material announced recently by Pfaudler is finding widespread application as both an interior and exterior coating for metals in the chemical, petro-chemical, pulp and paper and pharmaceutical industries. Its basic ingredient, Hercules Penton, (a chlorinated polyether polymer) has almost universal resistance to acid-alkali corrosion up to 210 deg. F.

Dry Clime Appoints New England Rep

Stuart Minard

Stuart Minard, of the New England Spray Equipment Co., Concord Road, Marlboro, Mass., has been appointed sales representative for the driQuik line of ceramic-type electric infrared industrial drying ovens manufactured by the Dry Clime Lamp Corp., Greensburg, Ind.

In addition to driQuik infrared ovens, the New England Spray Equipment Co. carries a line of related finishing equipment and offers complete engineering and installation service.

Westinghouse Appoints Lea Ultrasonic Cleaning Sales Agent

The Lea Manufacturing Co., Waterbury, Connecticut, has been appointed sales agent in Connecticut, western Massachusetts and northern New York for Westinghouse ultrasonic cleaning equipment.

The Waterbury firm, headed by Earle W. Couch, is a manufacturer of

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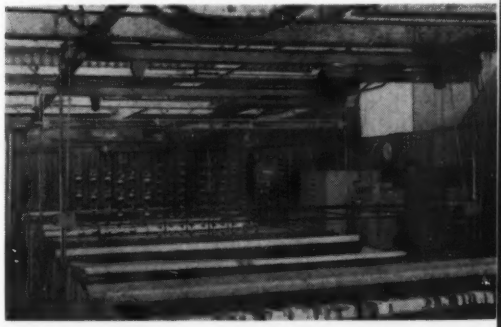
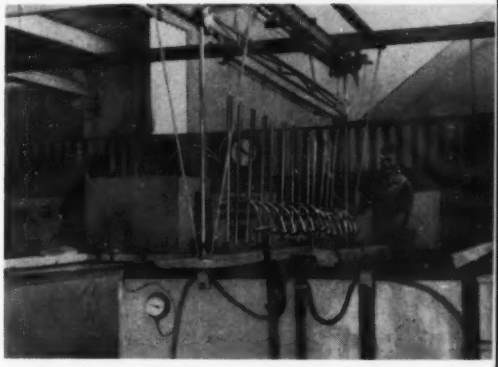




Plating in the "land down under" is not unlike that done in the United States. These cuts show several views of an "in-line" nickel-chrome setup in the plant of Industrial Plating Co., Pty., Ltd., a job shop in Perth, Australia.

industrial abrasive compositions and electrochemical processes. It will handle all lines of Westinghouse ultrasonic cleaning equipment, produced at the company's Industrial Electronics Department in Baltimore, Maryland.

Dry Clime Appoints Grenco As West Coast Representative

Grenco, Inc., Portland, Oregon, has been appointed west coast representative for Dri-Quik ceramic-type electric infrared ovens, according to M. N. Kanouse, president of Dry Clime Lamp Corporation, Greensburg, Indiana.

H. John Knapp

H. John Knapp heads Grenco, Inc. He also represents several other manufacturers of finishing equipment.

NEW POSITIONS

Two new vice presidents of **Hooker Chemical Corporation, Dr. Chris A. Stiegman** and **Charles C. Hornbostel,** were elected recently at a board of directors meeting.

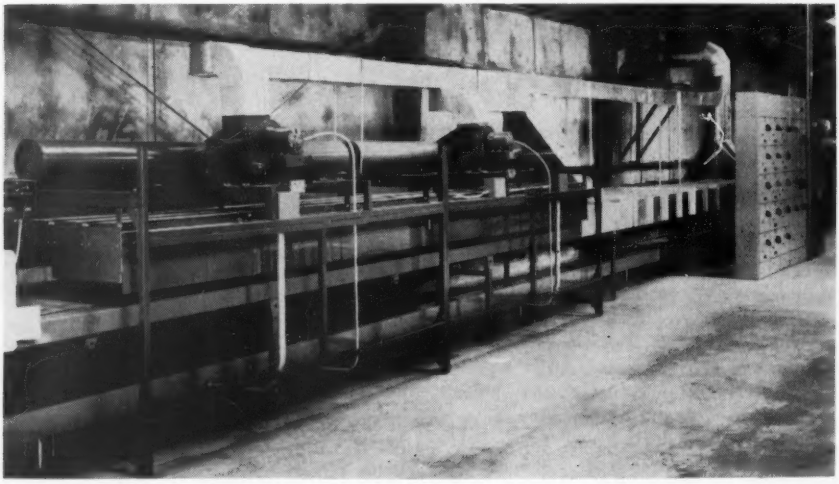
Dr. Stiegman is now vice president-research and development, and Mr. Hornbostel is vice president-finance.

★ ★ ★

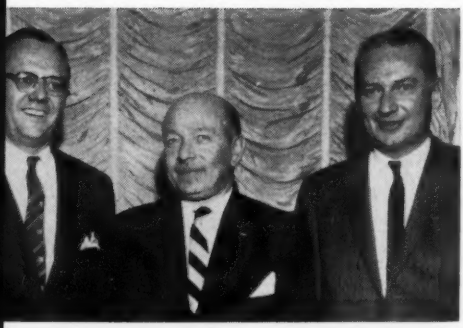
The appointment of **Al Korbelak** as vice president, **Sel-Rex Corporation,** and **Sid Mitwol** as vice president of **The Meaker Company,** a subsidiary, has been announced by Morris M. Messing, president of both companies.

Mr. Korbelak's area of responsibility will continue to be the development of applications and new markets exploration for Sel-Rex's diversified line of Precious Metal Electroplating Processes as well as liaison with the technical staff in the development of new products for which field work may have uncovered need. Additionally, Mr. Korbelak will supervise all Sel-Rex Customer Services.

Mr. Mitwol, who has been general



Dri Quik Ceramic Infrared Oven: ready for testing at Grenco, Incorporated, Portland, Oregon.



(Left to right) Al Korbelak, Morris M. Messing, Sid Mitwol.

manager, Rectifier Division, for the past year, will continue in this function as vice president and general manager, Electrical Division, The Meaker Company. The position includes line responsibility for all activities of the division . . . sales, manufacturing and product development.

★ ★ ★

Pangborn Corporation has named **Linwood A. Stedman** manager of the New England district with offices in Springfield, Mass. He succeeds John H. Connolly, who retired recently after 22 years as district manager.

★ ★ ★

John Chahbandour has been appointed a partner of **Nelson Engineering Sales Co.,** Pittsburgh sales representative for **The W. W. Sly Manufacturing Co.,** Cleveland.

Mr. Chahbandour will provide sales and application engineering for Sly dust control systems, industrial ovens, blast cleaning equipment and tumbling mills.

★ ★ ★

Detrex Chemical Industries, Inc. announces several promotions in its Industrial Sales Division.

Effective immediately, **Gordon A. Jacobs** will assume the duties of sales manager in the Industrial Division. **Paul W. Moehle** has been appointed product manager of Industrial Solvent

Bruce A. Young

Gordon A. Jacobs

David E. Williard

Paul W. Moehle

Sales and coordinator of jobber relations. **Bruce A. Young** has been appointed product manager of Industrial Equipment Sales.

David E. Williard has been appointed special assistant to E. W. Allison, vice president of sales.

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Chester F. Delbridge appointed as product manager, welding equipment and accessories, for **Metal & Thermit Corporation.**

Chester F. Delbridge

Fred W. Steinhebel

Fred W. Steinhebel appointed manager of Technical Coatings Division, **John J. Fannon Products Co.,** Detroit Subsidiary of the Hupp Corporation.

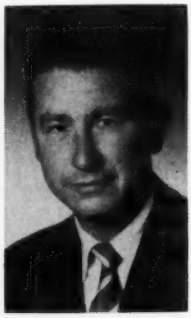
★ ★ ★

Chicago Vitreous Corporation, Division of Eagle Picher Co., has announced several promotions.

New vice presidents of the Chicago producer of porcelain enamel frits are **Harold M. Flye,** vice president-comptroller, **Leroy A. Johnson,** vice president-frit sales, and **Harry J. Van Dolah,** vice president-frit research.

Chicago Vitreous also has promoted **William L. Donaldson** to district manager for the Illinois-Michigan-Wisconsin-Minnesota territory; **Lee C. Anderson** to eastern district sales manager; and **James I. White** to service engineer for southern territory.

Leroy A. Johnson



Harry J. Van Dolah

Peder Field

Harold M. Flye

Hanson-Van Winkle-Munning Company has appointed **Peder Field** conveyor sales engineer. In this position, Mr. Field will be responsible for sales-engineering of H-VW-M automatic and related metalfinishing processing equipment. He will be based at the company's headquarters at Matawan.

★ ★ ★

John K. McGuire appointed manager, transportation sales and national accounts, for **The Glidden Company's** Paint Division.

"GRIPALLOY"

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Synthetics—Vinyls

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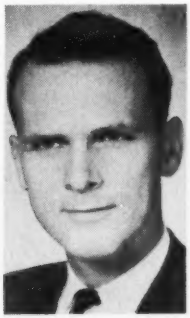
Richard L. Moody appointed assistant sales manager of **Wilson Rubber Co.,** Canton, Ohio, a division of Becton, Dickinson and Company.

Richard Moody



Richard B. Houghton

Richard B. Houghton appointed vice president-engineering for the California operations of **Acoustica Associates, Inc.**

★ ★ ★

Oakite Products, Inc. has appointed two technical service representatives to the company's field organization: **Robert D. Casey** and **Michael D. Juliana.**

Mr. Casey will represent the company in Arizona, with headquarters in Phoenix. Mr. Juliana has been appointed to the Charleston, West Virginia territory.

Robert Casey

M. D. Juliana

Walter C. Archinal appointed superintendent of coatings production at **Metal & Thermit Corporation's** Carrollton, Kentucky plant.

Martin H. Pollack

Walter C. Archinal

Martin H. Pollack has joined the **Sethco Manufacturing Corp.,** Merrick, N. Y., manufacturer of custom filtration equipment, as a sales and development engineer.

★ ★ ★

Northwest Chemical Company has appointed **John V. Brown** technical service representative in the Northwest Ohio area.

Mr. Brown will work from his home office at Angola, Indiana.

Northwest also has appointed **John M. Peabody** to serve accounts in the Youngstown and Pittsburgh areas.

Mr. Peabody will headquarter in the company's main office in Detroit.

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Thomas Kohler has been named New York State resident sales engineer for **Sel-Rex Corporation,** Nutley, N. J., manufacturer of precious metal plating processes. In his new assignment, Mr. Kohler will report to **Rene Sonnenfeldt,** Sel-Rex's representative in the area for several years, who has been promoted to district manager. Messrs. Sonnenfeldt and Kohler will handle rectifier equipment and automatic processing machinery manufactured by The Meaker Company, a wholly owned subsidiary of Sel-Rex.

Thomas Kohler

Rene Sonnenfeldt

★ ★ ★

Detrex Chemical Industries, Inc., appointed **James E. Maloney** to the newly created post of research supervisor, Chemical Processing Division.

★ ★ ★

Robert F. Cox recently joined **Pangborn Corporation** as a sales engineer. Formerly with **Cummins Engine Co., Inc.,** Columbus, Indiana, he will be assigned to Pangborn's Hagerstown and Baltimore districts.

★ ★ ★

Allen J. Rosenberg appointed assistant manager of quality control at **Simmons Plating Works, Inc.,** Atlanta, Ga. Mr. Rosenberg is graduate of Massachusetts Institute of Technology, with a B.S. in metallurgy.

Tect, Inc., Northvale, New Jersey has appointed **Wesley W. Guptill** general sales manager.

Mr. Guptill will assume responsibility for the marketing of Tect safety solvents, detergents and marine products.

Wesley W. Guptill

Roy H. Minton

The **Industrial Systems Company,** Matawan, New Jersey, has appointed **Roy H. Minton** sales engineer.

★ ★ ★

Dr. Donald M. Black appointed manager of development and market research, **Diamond Alkali Company.**

MEETINGS

Speakers at Detroit Branch A.E.S. Annual Meeting Discuss Automotive Trim

"Service Performance of Automotive Decorative Plating" was the topic for discussion at the Annual Meeting of the Detroit Branch, A. E. S., held Dec. 2 in the Statler Hilton Hotel.

Branch President Fred E. Olmstead, Curtiss-Wright Corp., opened the meeting, after which Educational Chairman Richard A. Fellows, Udylite Research Corp., introduced A. E. S. President Dr. W. Andrew Wesley, International Nickel Co., who served as technical chairman for the meeting. Dr. Wesley, in commenting on the

relationship between accelerated service tests and actual performance of plated coatings, stated: "Our main goal is not to produce plated coatings that will pass the tests, but to deposit coatings that will have a good appearance and stand up in service."

Gert G. Levy, materials development engineer, Chrysler Corp., reviewed the results of an inspection of 1500 cars in service to determine the degree of corrosion of the plated parts. This inspection seemed to indicate that nickel and chromium plated brass parts showed the most rapid corrosion, and that nickel (duplex) and chromium plated steel parts showed the least corrosion.

Chromium plated stainless steel performed better than unplated stainless steel, according to Mr. Levy. He described the inspection program and the results obtained.

Harold A. Kahler, liaison engineer, Research Staff, General Motors Corp., described the inspection of 2,036 cars in Detroit and 407 cars in Miami, which included the inspection of some 50,000 individual parts. Cars of 3 model years were inspected; 52% were General Motors cars, 19% were Chrysler cars, and 9% were Ford cars. The inspectors found less than 5% failure of plated coatings, and Mr. Kahler expressed the opinion that the use of double nickel coatings and heavier chromium coatings had significantly improved coating performance.

Vincent J. Cassidy, staff engineer, Ford Motor Co., described both accelerated test and service results noted by his investigators. He described these results in detail with reference to a general question: "Should I Convert My Plating Facilities to Duplex Nickel?" At the end of his presentation, Mr. Cassidy stated that his answer to that question, as a result of his investigations, was "Yes."

On Saturday, Dec. 3, the Detroit Branch Annual Banquet was held. A joint hospitality cocktail hour and "after-glow" was held by 32 supplier companies. Most of the host companies are members of the Metal Finishing Suppliers' Association, which has promoted the idea of holding joint-hospitality events.

Vacuum Coaters in Chicago March 1-2

The fourth annual Technical Conference of the Society of Vacuum Coaters will be held at the Conrad Hilton Hotel in Chicago, March 1-2. The first day will be devoted to general business and committee sessions—the second, to two concurrent technical sessions, one for functional vacuum coating, the other for decorative applications.

(continued)

Technical chairman and speakers at symposium on "Service Performance of Automotive Decorative Plating." Shown (left to right) are: Dr. W. Andrew Wesley, A. E. S. president; Harold A. Kahler, General Motors Corporation; Gert G. Levy, Chrysler Corporation; Vincent J. Cassidy, Ford Motor Company. (PRODUCTS FINISHING Staff Photograph.)

Some of the papers to be presented include the following:

Summary of Anti-Reflection Coatings for Glass and Infrared Substrates, by J. G. Cox and G. Hass, U.S. Army Engineering Research and Development Laboratories.

Semi-Conducting Thinfilms, by J. Buttery, of the Armour Research Foundation.

Infrared Cut-Off Filters, by P. Slater, of the Armour Research Foundation.

Resistive Thinfilms, by E. H. Layer, of Battelle Memorial Institute.

Preparation and Evaluation of Thinfilm Micro Circuits, by Dr. Patton, International Resistance Corporation.

Preparation of Thick Films for Ruling Diffraction Gratings, by E. Leibhardt, Diffraction Products Company.

Interferometric Measurements of Thinfilms, by P. Meyn, Gaertner Scientific Corporation.

Evaporation by Electron Bombardment, by NRC Equipment Corp.

Continuous Vacuum Metallizing, by F. J. Stokes Corporation.

Tooling for Spraying and Metallizing, by T. J. LaBounty, Midwest Technical Service.

Automation on Second-Surface Applications, by H. E. MacArthur, Conforming Matrix Corporation.

At a luncheon meeting, W. Strickland of Simpson Optical Manufacturing Company will present an up-to-date picture of European optical coating, followed by M. A. Self of Bee Chemical Company speaking on modern European decorative coatings.

Dayton A.E.S. Annual on March 4

The Dayton Branch of the American Electroplaters' Society will hold its Fifteenth Annual Educational Session and Dinner Dance on Saturday, March 4, 1961, at the Hotel Biltmore, Dayton, Ohio. Honorary chairman of the day will be A.E.S. President W. Andrew Wesley, International Nickel Company, Bayonne, New Jersey.

Dayton-Branch President Byron A. Bowman has appointed Lawrence H. Hadlock as general chairman, Robert D. Fisher co-chairman, and the following men committee chairmen: Walter W. Anderson, Educational; Albert W. Wendt, Tickets; Jack V. Baker, Hotel Arrangements; John Easton, Program & Advertising; Robert Ruleff, Entertainment; John Myers, Favors; Duanne Prosser, Secretary; and Roy Critchfield, Publicity.

The Educational Session will start promptly at 1:15 P.M. in the Hilton Room.

Program is as follows:

Adhesion of Electroplated Metals, by Dr. Hyman Chessin, director of research, Van der Horst Corporation of America, Olean, New York.

Plating — Art or Science? by A. H. DuRose, Harshaw Chemical Co., Cleveland, Ohio.

High - Temperature Properties of Electroplates, by William H. Safranek, Battelle Memorial Institute, Columbus, Ohio.

Dr. Hyman Chessin

William H. Safranek

A. H. DuRose

The evening festivities will begin at 6:15 P.M. in the Junior Ballroom with a cocktail party given by suppliers, followed by dinner to be served at 6:45 in the Main Ballroom. The price of tickets is $7.00 per plate.

Rockford A.E.S. Annual on March 11

Tentative program for the Annual Meeting of Rockford Branch, to be held March 11 at the Faust Hotel:

9:30 A.M.—Registration.

10:00 A.M.—Educational Session.

Preparation of Metal Surfaces for Painting, by Ezra A. Blount, editor of PRODUCTS FINISHING.

Ezra A. Blount

"NAMF's Role in Metal Finishing," by A. T. Leonard, president, Superior Plating, Inc.

12:30 P.M.—Luncheon.

2:30 P.M.—Metal Finishing Workshop, Leonard Weeg, moderator.

Leonard Weeg

A. T. Leonard

The meeting will conclude with banquet and entertainment.

Titles of Papers To Be Presented at A.E.S. National Convention

The tentative educational program for the 48th Annual Convention of The American Electroplaters' Society has been released. The first paper will be presented on Monday, June 19, at 2:00 P.M. Other sessions will be held on the remaining days of the convention, which ends Thursday, June 22.

Titles of papers tentatively scheduled are as follows:

William Blum Lecture. Speaker, Dr. Charles L. Faust, Battelle Memorial Institute, Columbus, Ohio. Session chairman, Dr. William Blum.

Research Committee Chairman's Presentation, by Dr. D. Gardner Foulke.

Research Project No. 14—A Microscopic Study of Chromium Plating.

Report on Research Project No. 15, by Walter L. Pinner.

Latest Practical Applications for Organosols as Protective and Decorative Finishes.

Overcoming Organic Finishing Problems.

New Epoxy Primer — Acrylic Lacquer Finish System.

Nickel-Chromium Plating Upon Anodized Aluminum.

Chemical Conversion Coatings for Aluminum Alloys.

Outdoor Exposure of Anodic Coatings on Aluminum: Effect of Sealing.

The Effect of Voltage During Anodizing of Aluminum.

Plating on Magnesium by Electrodeposition and Chemical-Reduction Methods.

Anodizing or Conversion Coating of Magnesium.

Chromic Acid Anodizing of Beryllium: Part I.

Chromic Acid Anodizing of Beryllium: Part II.

(continued)

George J. Marotta

Louis V. Gagnon

George P. Swift

Manson Glover

Forum on Finishing of Light Metals.

Quality-Control Symposium. To Determine Optimum Conditions for Barrel Plating in Zinc Cyanide Solutions.

The Practical Application of Statistics to Quality Control of Electroplated Products.

Overcoming the Limitations of Electroforming—A Progress Report.

The Anodic Behavior of Metals in Cleaning Media — Copper and Alloys.

Production Nickel Plating on Molybdenum.

Improved Adhesion of Electroless Nickel Plating on Titanium Alloys.

Precious Metal Plating and Solderability.

Recent Developments in the Use of Electroplating in the Additive Method of Printed Wiring Manufacture.

Stoichiometery of Copper Bonding Using Copper Oxide.

Electromotive Series of Different Nickel Deposits.

Dual-Chromium Plating of Zinc Die Castings.

Objectives in Corrosion Protection of Bright Decorative Trim and Their Implementation.

Plating of Printed Circuits with Pyrophosphate Copper and Tin-Nickel.

Evaluation of Solderability of Electroplated Coating.

Producing Ultra-High-Frequency Electronic Parts by Electroless Copper and Precious Metal Plating of Plastics.

This year's National A.E.S. Convention will be hosted by the Boston Branch. Headquarters hotel is the Statler. General chairman of the meeting is Louis V. Gagnon, Enthone, Inc.

George P. Swift, consultant, is administrative co-chairman, while George J. Marotta is technical co-chairman. Manson Glover, Glover Coating Co., will handle finances and act as liaison representative for all Metal Finishing Suppliers' Association meetings and functions.

Further information can be obtained from Mr. Gagnon by writing to him at P.O. Box 329, Framingham, Mass.

Chicago A. E. S. Annual: Plating Overseas

"Plating in Foreign Lands" was the topic for the educational session at the 49th Annual Meeting of the Chicago Branch, A. E. S., held January 28 in the Conrad Hilton Hotel, Chicago.

Speaking on conditions in Europe's plating industry from knowledge gained on a recent trip to England and the continent was Myron B. Diggin, vice president and technical director of Hanson-Van Winkle-Munning Co., Matawan, N. J.

Ezra A. Blount, editor of *Products Finishing,* described the plating industry now prospering in Japan, Formosa, Hong Kong. Simon P. Gary, Scientific Control Laboratories, Inc., served as program chairman for the session.

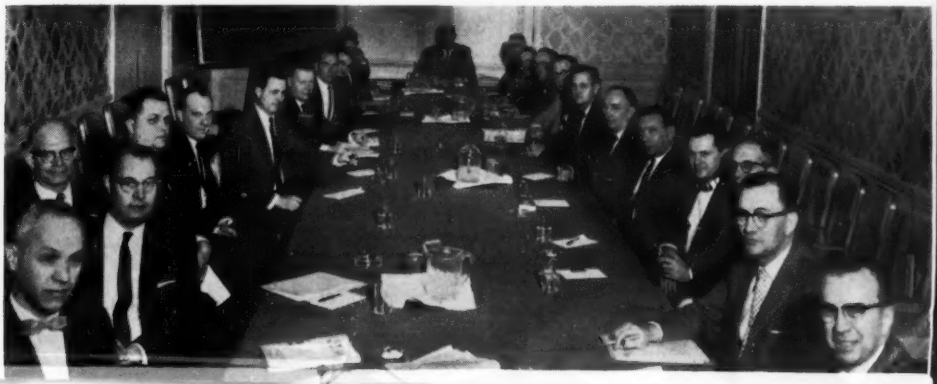
Prior to the educational session, The Udylite Corporation held a luncheon for job platers at which its new nickel processes, Satylite and N2E-66, were described.

Photos on this page show highlights of the day.

Fig. 1—(Left to right): Simon P. Gary, Ezra A. Blount, Myron B. Diggin.

Fig. 2—Udylite Chicago Manager Larry George speaks on Satylite, new Udylite nickel plating process. Parts plated with Satylite are displayed at right.

Fig. 3—A. E. S. Midwest Regional Council representatives met to discuss the 1961 Regional Conference and the 1961 A. E. S. Convention. (PRODUCTS FINISHING Photos)



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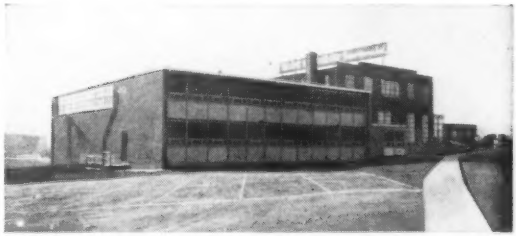

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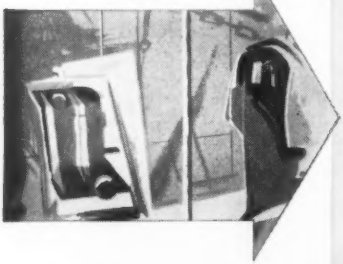

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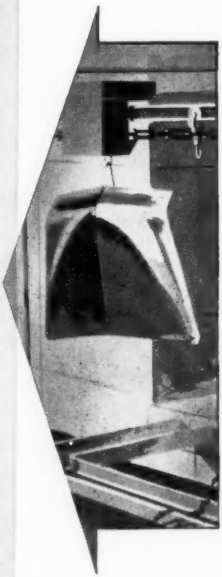

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